



This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

### Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

- + *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
- + *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
- + *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
- + *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

### About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at <http://books.google.com/>





600040452L

pt. 16









b6  
b7C

b6  
b7C

b6  
b7C

b6  
b7C

b6  
b7C

b6  
b7C



PATENTS FOR INVENTIONS.

---

ABRIDGMENTS

OF THE

Specifications

RELATING TO

INDIA RUBBER [CAOUTCHOUC]  
AND GUTTA PERCHA:  
INCLUDING AIR, FIRE, AND  
WATER PROOFING.

---

PRINTED BY ORDER OF THE COMMISSIONERS OF PATENTS.

---



LONDON:

PRINTED BY GEORGE E. EYRE AND WILLIAM SPOTTISWOODE,  
PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY.

PUBLISHED AT THE GREAT SEAL PATENT OFFICE,  
25, SOUTHAMPTON BUILDINGS, HOLBORN.

1859.

176. v. 30.





## PREFACE.

---

THE Indexes to Patents are now so numerous and costly as to be placed beyond the reach of a large number of Inventors and others to whom they have become indispensable.

To obviate this difficulty, short abstracts or abridgments of the Specifications of Patents under each head of Invention have been prepared for publication separately, and so arranged as to form at once a Chronological, Subject-matter, Reference, and Alphabetical Index to the class to which they relate. As these publications do not supersede the necessity for consulting the Specifications, the prices at which the latter are sold have been added.

B. WOODCROFT.

Great Seal Patent Office,  
October 1859.



## INDEX OF NAMES.

The names of persons by whom inventions have been communicated from  
abroad, when known, are printed in *italics*.

	Page		Page
Abate, F. ....	442	Bagley, J. W. ....	177
Ackermann, R. ....	8	<i>Bailey, J. S.</i> ....	402
Adams, H. W. ....	171	Bain, A. ....	612
—, W. B. ....	524, 561	Bainbridge, A. F. ....	227
Addenbrooke, J. ....	179	Bakewell, F. C. ....	606
Addison, J. ....	556	Balistrini, P. A. ....	580
Ager, G. ....	339	Ball, T. ....	177
Alcock, J. ....	644	Banner, E. G. ....	391
Allan, T. ....	273	Barclay, A. ....	598
Alliott, A. ....	141	Barker, D. ....	323
Allison, S. S. ....	472	Barlow, E. ....	464
Allport, E. ....	208	—, H. B. ....	581
Alphey, G. ....	8	—, W. H. ....	127
Alsop, W. ....	78	Barr, D. ....	543
Anderson, Sir J. C. ....	296	Barratt, B. ....	308
—, G. ....	404	Barthelemy, N. F. ....	296
<i>Andrien, A.</i> ....	574	Bartlett, H. V. ....	101
Applegarth, A. ....	380	Barton, B. ....	279
Archer, A. E. D. K. ....	300, 374	Bate, H. ....	337
—, W. ....	183, 268	Bateman, D. ....	320
Archereau, H. A. ....	450, 451	Batley, W. ....	486
Arthur, R. ....	493	Baylis, J. ....	205
Aebury, J. V. ....	271	Baynham, W. ....	12
—, W. ....	387	Beall, J. ....	398
Ash, R. ....	273	Beard, R. ....	68
Ashworth, R. ....	536	Beauché, L. ....	603
Assanti, D. ....	434	Bedells, C. ....	60, 73, 404, 575
Aston, E. O. ....	469	Beehy, W. ....	515
Aubusson, C. W. F. ....	468	Bell, C. W. ....	161, 310
Audemars, G. ....	542	Bell, G. ....	206
Austen, W. ....	393	Bellamy, J. ....	5
—, A. I. ....	351	Bellford, A. E. L. ....	213, 251, 270, 426, 437, 454, 486, 542
Austin, H. ....	65	Beltzung, F. J. ....	185
Ayckbourn, F. ....	254, 328	Benjamin, W. ....	13
Babb, W. ....	317	Bennett, S. ....	490

	Page		Page
Bentley, H. ....	257	Brady, J. D. ....	182, 313, 385
Bentley, J. ....	248	Bridges, H. ....	430
—, N. ....	644	Brims, D. ....	345
—, W. H. ....	457, 459	Brindley, E. H. ....	486
Berdan, H. ....	531	—, W. ....	139
Bernard, J. 180, 193, 293, 304,		Brinsmead, H. ....	265
460, 504		Brockedon, W. ...	77, 106, 172
Berriedale, Lord. ....	510, 533	Brookes, W. ....	322, 325, 457
Berry, H. ....	23	Brooman, R. A. 79, 81, 268, 326,	
—, J. ....	306	332, 334, 354, 420, 454, 457,	
Bertolacci, W. R. ....	228	473, 522, 538, 570, 616, 623,	
Bessmer, H. 176, 242, 327, 341		626, 629, 656, 659	
Bestwick, H. ....	596	Brown, A. ....	398
Bethell, J. ....	51, 283	—, J. ....	206, 320, 444
Betjemann, H. J. ....	372	—, J. H. ....	317
Betteley, J. ....	508	—, S. R. ....	431
Bewley, H. ....	88	—, W. ....	431
Biddell, W. A. ....	448	Browne, J. ....	136
Bielefeld, C. F. ....	91, 569	<i>Brunessaux, J. J.</i> ....	653
Bingley, M. ....	108	Buchholz, G. A. ....	165
Binks, T. ....	541	Bull, E. ....	266
Binns, W. ....	230	—, W. ....	653
Bird, E. ....	230	Bunker, C. J. ....	636
—, J. ....	417	Bunn, L. St. L. ....	173, 647
Blackwell, S. ....	286, 287, 543	Burch, J. ....	255
Blackwood, J. ....	625	Burgess, W. ....	189
Blades, J. ....	25	Burke, H. ....	142
Blain, J. ....	242	—, W. H. ....	75, 93
Blair, G. ....	209	Burley, G. ....	661
—, J. ....	242	Bursill, G. H. ....	540
Blashfield, J. M. ....	477	Burton, B. A. ....	289
Blizzard, W. ....	660	—, H. M. ....	289
Blythe, P. P. ....	533	—, J. W. ....	653
Boccia, G. ....	405	Bury, I. ....	369
Bogue, D. ....	474	—, J. ....	596
Bolton, J. ....	506	Busson, C. A. ....	551
<i>Boniere, M., the younger</i> ...	640	Butcher, M. ....	560, 579
Bonnall, J. ....	514		
Bonnet, B. ....	569	Carosio, A. ....	284
Booth, T. ....	306	Carpenter, S. A. ....	316
Bossy, A. ....	87	Casartelli, J. L. ....	609
Bowra, M. E. ....	309, 350, 617	Caslon, W., junior ....	16
Bouvet, J. L. P. J. B. H. ...	501	Cassell, E. E. ....	77
Bourquin, J. P. ....	418	Cazalat, A. G. ....	267
Bousfield, G. T. 570, 613, 614,		Chabert, J. E. ....	164
635		Chadwick, D. ....	295, 640
Bowden, T. ....	95	—, J. ....	250
Brackenbury, A. ....	243	Chalmers, D. ....	395

# INDEX.

b

	Page		Page
Chamberlain, A. P.....	650	Cortin, J. T.....	439
Chameroy, E. A. ....	520	Cortland, J. ....	529
Chapman, G. ....	615	Corvi, A. ....	494
Chappuis, E.....	437	Cotter, J. B. ....	78
Chatterton, J. ....	172, 302	Couchman, J. W. ...	215, 254
Chatwin, J. F. ....	598	Couper, J., senior .....	506
—, T. T. ....	598	<i>Courtelle, E. C. T.</i> .....	629
Chaudet, H.....	526	Coutts, J. ....	637
<i>Chaumont, P. W.</i> .....	511	Cowley, J.....	632
Cheetham, D. ...	102, 155, 212	Cox, A. H. ....	458
Childs, J. ....	365	—, G. A. ....	493
Christen, H. J.....	162	—, T.....	423
Christopher, W. ....	326	Craddock, T. ....	505, 634
Church, W. ....	580	Crapelet, C. ....	558
Clark, C. ....	579	Critchley, T.....	280
—, J....	11, 64, 84, 133, 579	Crofts, W. ....	372
Clarke, J. P.....	496	Crosby, J.....	227
—, S.....	247	<i>Crosby, J. B.</i> .....	578
—, W. ....	616	Crossley, J. ....	167
—, W. A. ....	649	—, T. ....	512
—, W. H.....	349	Culpin, T.....	305
Clarkson, T. C.....	137, 269	<i>Cumengé, L. P. B. E.</i> .....	396
Clewe, T. F. E: ....	550	Cutteau, P. J. ....	8
Clifton, Sir R. J.....	453		
Clough, C. B. ....	192	Daft, T. B....	81, 110, 116, 217, 323, 542, 602
Coates, C. ....	378, 400	Dalton, J.....	144, 149, 429
Cochrane, A. ....	346	Danks, J. ....	504
—, W. E. ....	288	Danne, L. J. A. ....	644
—, W. M.....	288	Dannequin, A. E.....	596
Cockings, J. S.....	583	<i>Davenport, H.</i> ....	618
Codet-Negrier, J. L. ....	643	Davies, G. ....	607
Coffin, D. N. B., junior ...	566	—, J.....	52
Coleman, J. E.....	190	Davis, D. L.....	564
Coles, C. B. ....	24	—, E. K.....	396
—, R. G.....	406	—, I. ....	267
Collier, G. ....	141, 436	—, M. ....	204, 335
Collins, W. W. ....	595	—, W. B. ....	206
Constable, W. ....	269	Davy, E. ....	44
Cook, A. ....	384	Dawson, T. ....	440
—, B. ....	16	Day, E.....	307
—, H. ....	384	—, G. T. ....	307
Cooke, B. F.....	514	—, H. ....	645, 646
—, W.....	473	—, T.....	303
Cooley, A. J. ....	222	Deale, A. ....	304
Corbett, V. P. ....	542	Death, E. ....	541
Corbitt, W. ....	601	De Bergue, C. ...	117, 125, 135, 153, 210, 291, 441
Corlett, H. L. ....	412		
Cornides, L.....	509, 532, 553		



	Page		Page
De Breza, E. R. L. ....	48	Ebert, C. H. R. ....	530
De Clippele, C. ....	656	Edgar, W. ....	271
Defever, C. L. ....	328	Edmonds, T. ....	33
Delpeche, J. A. C. N. ....	482	Edwards, C. J. ....	419
Denham, W. T. ....	234	——, T. ....	431
De Pariente, L. ....	567	Egan, J. ....	214
Deplanque, L. E. ....	633	Ellins, G. ....	222, 373
Derbyshire, J. ....	612	Ellis, T. ....	629
Dering, G. E. ....	386, 609	Elmsley, S. ....	3
Derrington, J. ....	250	Erckman, C. ....	424
Deseille, L. F. A. ....	356	Ewing, J. ....	609
Desgrand, J. V. ....	31	Exall, W. ....	599
Deutsch, A. ....	255	Eyres, J. ....	1
Devincenzi, G. ....	444, 459		
Devon, W. ....	658	Fairbairn, P. ....	307
De Witte, G. J. ....	151	Fairman, W. H. ....	17
Dewsnup, T. ....	353	Fall, J. ....	336
D'Homme, P. ....	250	Fanshawe, H. R. ....	535, 554
D'Houdetot, M. ....	371	——, J. A. ....	61, 535, 554
Dick, D. ....	376	Farjon, L. A. ....	519
Dickinson, G. W. ....	13	Farmer, Sir G. R. ....	462
Dicks, W. ....	261	Fawcett, F. B. ....	561
Dickson, J. H. ....	392	——, W. ....	561
Dié, G. ....	464	Feather, R. B. ....	244
Dixon, E. J. J. ....	188	Ferguson, J. ....	374
Dodge, N. S. ....	594	Fernandez, A. H. ....	247
Dodson, A. J. ....	188	Field, J. J. J. ....	658
Dowse, C. ....	109	Fife, G. ....	263, 265
Dowie, J. ....	44	Finch, E. ....	358
Drake, J. C. ....	66	Fisher, D. ....	120
Dresser, C. ....	251	Fleetwood, C. B. ....	19
Drew, A. ....	395	Fletcher, J. ....	557
Duke, E. ....	9	Fontainemoreau, P. A. L. ....	
Dulaurier, B. ....	270	134, 240, 277, 346, 347, 361,	
Dumeste, J. F. M. ....	31	391, 478, 481, 487, 497, 527,	
Duncan, C. S. ....	262	528.	
——, J. W. ....	102, 174, 301,	Ford, A. ...	581, 592, 608, 619
	343	Forster, J. T. ....	146
——, T. ....	610	——, T. ...	74, 78, 117, 120,
Dundonald, Admiral the		127, 142, 347	
Earl of ....	234, 282	Forty, A. E. ....	449
Dunlop, J. M. ....	205, 504	Foulkes, T. B. ....	485
Durant, A. H. A. ....	580, 633	Founobert, C. F. J. ....	624
Duthoit, A. M. ....	179	Fox, H. H. ....	72
Duvivier, H. J. ....	526	Frankham, S. ....	325
		Franks, R. ....	14
Eassie, W. ....	417, 484	Fraasi, H. G. ....	509
Eaton, R. ....	624, 626	Freeman, W. ....	58

# INDEX.

5

	Page
Friend, G. W. ....	553
Froggart, R. B....	178, 263, 265
Frost, H. ....	640
Fry, J. ....	393, 625, 657
Fuller, J. ....	303
——, W. C. 89, 210, 467,	537, 603
Gale, J. W. ....	305
Galloway, E. ....	72
——, J. ....	443
Gardissal, C. D. ....	485
Garnett, J. ....	639
Gaskell, P. ....	336
Gaullié, A. ....	191
Gedge, J. ....	574
Gerard, G. E. M.....	154, 258
Germaine, G. ....	469
Gidley, G.....	326, 383, 605
Gilbee, W. A. ....	327
Gilbert, H. ....	438
——, J. A. ....	315
Gilpin, W. ....	456
——, W. L. ....	228, 229
Gizard, L. A. ....	601
Glover, C. C. ....	244
Godefroy, L.....	218
——, P. A. ....	566
Gollop, J. A. ....	604
Goodall, J. C. ....	152
Goodyear, C. 71, 194, 195, 197,	198, 199, 200, 201, 202, 203,
204, 207.	
Goodyear, C. 309, 340, 341,	342, 343, 362, 363, 386, 401,
552, 555, 572, 573, 574, 575,	587, 616, 620, 635, 636.
Goodyear, C., jun. 549, 618, 638	
Gosnell, C. ....	235
——, J. E. ....	235
Gougy, P. F. ....	108
Grace, G. ....	419
Graham, C. W.....	224
——, J. B. ....	427
Grahame, T.....	314, 378, 582
Grant, P. ....	417
Grantham, J. ....	147
Gray, J.....	502

	Page
Gray, T. W.....	198
Green, B. J.....	435
——, H. T. ....	545
——, W.....	321, 369, 516, 610
Greenwood, J.....	405
Gregory, J. ....	540
Griffiths, J. ....	364, 371
——, R. ....	496
Grundy, D. ....	639
Guesdron, A. G. ....	401
Guibal, C. E. F. ....	396, 397
Guichard, E. A. D.....	481
Gurney, J. ....	550
Guyet, P. J. ....	659
Gwynne, J. ....	169
Hackett, J. ....	485, 488
Hadley, C. ....	275
Haichois, C. J. L. M. ....	603
Haigh, T.....	301
Haines, M. J. ....	145, 147
Hale, J. L. ....	105
Haley, J. ....	586
Hall, J. H.....	54
——, R. ....	27
——, W. ....	243
Hance, W. ....	10
Hancock, C. 47, 63, 76, 91, 98,	111, 118, 127, 129.
——, J.....	55, 59
——, J. L.....	500
——, R. H.....	647
——, T. 15, 20, 21, 22, 29	42, 45, 69, 96, 106, 121, 123
——, W. ....	41, 68, 576
——, W. junior ....	60, 62
Hanson, G. ....	295
Hardon, E. ....	620
Harlow, J.....	460
——, R. ....	331, 605, 628
Harris, G. ....	27
——, G. D. ....	25
Harrison, C. W. ....	221
——, J. J.....	221
Harrold, F. W.....	560
Hartley, J.....	66
——, J. G. ....	39
Hawker, C. ....	589

	Page		Page
Hawker, T. P. ....	589	Hughes, H. ....	234
Haynes, W. ....	449	——, T. ....	358
Hayward, N. ....	628	Humpage, C. ....	283
Heald, H. ....	638	Hunclass, S. Y. ....	3
Hebert, L. ....	61	Hunt, E. ....	249
Helbronner, R. ....	161	——, J. ....	158
Hellewell, J. ....	34	Hurn, D. ....	377
Henderson, H. ....	506	Hurst, R. ....	151
Hendry, W. T. ....	647	Hutchison, W. ....	122
Henley, W. T. ....	236	Hyams, J. ....	539
Henry, J. ....	620	Hyde, W. ....	547
Henson, H. H. ....	564		
Herdman, H. P. ....	587	Illakowicz, M. N. ....	439, 503
Hess, R. ....	528	Ingall, G. H. ....	491
Heywood, B. J. 593, 612, 641, 647		Inglis, A. ....	599
Hibling, H. ....	587		
Hill, H. C. ....	551	Jacks, J. ....	9
Hincks, J. ....	167, 185	Jackson, G. ....	488, 538
Hirst, J., junior ....	284	——, H. ....	408
Hitchcock, J. ....	7	James, I. ....	405
Hitchins, H. ....	486	Jacob, G. W. ....	310
Hodge, P. R. ....	181	——, M. ....	133
Hodges, R. E. 172, 388, 455, 549		Jacobs, S. ....	162
——, W. ....	546	Jacquot, F. ....	530
Hoffstaedt, A. J. ....	543	Jefferis, J. ....	466
Holbeche, J. S. ....	438	Jeffs, W. ....	246
Holden, H. A. ....	266	Jennings, H. C. ....	160
Holdsworth, A. H. ....	104	——, J. G. ....	124, 590
Hollingsworth, T. ....	423	——, T. ....	432
Holman, S. ....	645	Jeune, F. C. ....	604, 629
Holmes, H. ....	557	Job, A. M. ....	579, 585
Hooper, G. N. ....	596	Jobard, J. B. A. M. ....	495
——, W. ....	596, 625	Johnson, H. ....	6
Horrocks, J. D. ....	324	——, J. H. 220, 258, 356, 371, 383, 396, 397, 446, 454, 468, 480, 511, 536, 545, 548, 558, 559, 563, 571, 576, 586, 588, 599, 634, 640	
——, J., junior. ....	324	——, R. ....	490
Horsfall, W. ....	619	——, W. 281, 298, 452, 464, 469, 499, 500, 561, 595, 620	
Houghton, G. ....	246	——, W. B. 487, 593, 626, 653	
——, W. ....	484	Jones, T. F. ....	419
Houston, J. ....	209, 294	Jonquet, D. ....	588
How, A. P. ....	540	Juvin, E. J. N. ....	631
Howard, T. ....	652		
Howson, R. ....	415	Kaselowsky, F. ....	307
Hoyle, R. ....	484		
Hubbard, J. ....	582		
Huddart, G. A. ....	245, 263		
Hughes, E. J. ....	627		

# INDEX.

7

	Page		Page
Kay, R. D. ....	506	Lepage, F. C. ....	582
Keefe, R. ....	524	Leuillet, J. B. ....	638
Keen, R. J. ....	491	Leverson, G. B. C. ....	324
Keene, C. ....	56, 85	Levisohn, L. J. ....	530
Kendall, G. ....	238	Lewis, G. G. ....	550
Kennedy, J. ....	547	—, J. ....	406
—, T. ....	523	Ley, G. W. ....	232, 233
Kent, A. ....	213	Liddle, C. ....	466
Kerr, T. ....	56	Liebhaver, J. C. B. ....	164
Kershaw, S. ....	497	Light, E. ....	115
Kestell, W. ....	455	Lilley, J. ....	346
Kimberley, J. ....	359	—, J., junior ....	367
Kind, J. D. ....	531	Lillie, J. ....	374
King, J. ....	651	—, Sir J. S. ....	175
Kingston, J. F. ....	253	Lippincott, J. ....	606
Kite, J., the younger ....	339	Lister, S. C. 282, 285, 330, 348	588
Kloet, J. ....	95	Livsey, P. J. ....	533, 615
Knapton, W. ....	654	Long, J. ....	654
Knevitt, G. M. ....	210	Longbottom, R. I. ....	236
Knevitt, G. M. ....	446	Longdon, R. ....	161
Knight, A. ....	266	Lorimier, A. ....	128, 622, 627
Knowles, J. ....	616	Lotsky, J. ....	245
—, P. ....	464	Lucas, G. ....	543
Knuth, L. F. H. C. ....	368	—, R. ....	163
Koch, A. ....	630	Lucevilliard, J. F. ....	452
Kraut, H. ....	470	Lumb, P. ....	219
Krupp, A. ....	592	Lund, E. ....	498, 649
Kurtz, C. A. ....	138	Lutel, E. O. ....	109
Labat, J. A., junior ....	370	Mabon, W. ....	409
Lacey, T. ....	216	Macbay, W. ....	225
Lacy, H. C. ....	24	Macintosh, C. ....	18
Laing, W. ....	610	—, J. 201, 207, 639, 655	
Lamb, J. ....	561	Mackenzie, D. ....	130
Lamport, C. ....	358	—, W. ....	209
Lane, D. ....	555	Magen, H. ....	521
Langenhagen, M. ....	528	Maneglia, F. G. P. M. V. ....	544
Latta, A. ....	590	Marié, E. H. ....	517
Leconte, L. ....	58	Markland, T. ....	479
Lees, T. ....	364	Marland, J. ....	640
Leese, J., junior ....	58, 187	Marshall, M. H. ....	67
Lefevre, J. ....	383	Martin, J. ....	38
Legras, L. N. ....	228, 229	—, R. ....	539
Legreze, P. ....	574	Martini, F. ....	473
Lehugeur, L. P. ....	537	Mason, J. ....	141
Lejeune, E. A. ....	653	—, S. ....	515
Lenettais, P. E. ....	640	Masters, J. ....	86, 126
Lemoine, J. ....	191		

	Page		Page
Mather, C. ....	518	Moulton, S. ....	110, 174
Mathieu, F. ....	498	Mowate, C. ....	1
Mathieu, J. ....	503	Munkittrick, A. ....	143
Maurice, J. ....	636	Murdoch, J. ....	248, 548
Mayer, J. ....	531	Murphy, J. L. ....	255
McDonald, J. R. ....	628	Murray, C. ....	549
McGaffin, J. ....	480	Murton, J. M. ....	563
McIntosh, J. ....	83	Muschamp, J. B. ....	383
McKinley, W. ....	648	——, W. ....	602
McLaine, A. ....	475	Myers, E. ....	567, 594
Meeus, P. J. ....	424, 427		
Meinig, C. L. A. ....	377	Nalder, F. ....	104
Mellish, T. R. ....	274	Nash, J. ....	456
Melville, W. ....	165	Nasmyth, G. ....	625
Mermet, J. F. ....	385	Naylor, H. M. ....	353
Menotti, C. ....	164	Needham, W. ....	339
Merrian, M. H. ....	578	Newall, R. S. ....	553
Metcalfe, J. ....	617	Newbery, G. J. ....	57
Methvin D. ....	565	Newry, T. H. ....	560, 579
Meyer, F. ....	155	Newton, A. V. ...	87, 105, 149, 152, 158, 159, 168, 186, 248, 266, 278, 367, 448, 492, 561, 589, 597, 618
Michel, F. A. V. ....	214	——, W. ....	157
Middlemore, W. ....	103	——, W. E. ....	71, 156, 170, 276, 322, 352, 399, 460, 463, 475, 630, 637, 642, 648, 655
Miles, E. ....	467, 537	Nichol, J. ....	236
Mill, W. ....	446	Nicholls, B. ....	562
Mills, J. ....	17	Nicholson, W. ....	24
Milner, G. ....	585	Nickels, B. ....	73, 90
Milwain, J. ....	148	——, C. ....	40, 53, 60, 65, 73, 80, 84, 115, 134, 138, 146, 177, 293, 299, 311, 368
Mitchell, W. ....	284	——, E. ....	290
Molesworth, R. ....	544	Nicoll, D. ....	299
Mollerat, J. B. ....	34	——, H. J. ....	272
Mollersten, C. F. ....	9	Nicolle, E. ....	185
Monckton, E. H. C. ....	636	Ninck, J. ....	632
Mondollot, A. ....	300	Nolet, P. D. ....	600
Monzani, L. ....	513	Normandy, A. L. M. ....	83, 277, 318
——, W. T. ....	474	<i>Nos d'Argence, M.</i> ....	589
Moore, R. R. R. ....	139	Nye, S. ....	648
Mordan, F. ....	471		
<i>Morey, A. C.</i> ....	634	Oates, J. P. ....	219
<i>Morey, C.</i> ....	548	Ogg, A. ....	494
Morgan, J. ....	291	Ogilvie, G. S. ....	238
Morison, J. ....	377, 434		
Morphet, W. ....	623		
Morrison, T. ....	24		
Moseley, J. W. ....	428		
Mosely, E. ....	253		
——, S. ....	445		
Mosley, G. ....	549		
Mouchel, L. A. M. ....	554		

# INDEX.

9

	Page
<i>Oudinot, C. L. L.</i> .....	109
<i>Owen, T. G.</i> .....	461
<i>Paget, F.</i> .....	577
<i>Paine, L. J.</i> .....	546
<i>Palmer, C. R. N.</i> .....	311, 314
——, T. ....	600, 621
——, T. ....	116
<i>Pape, J. H.</i> .....	513
<i>Parker, B.</i> .....	651
——, F. ....	261, 407
<i>Parkes, A.</i> .....	66, 97, 584
<i>Parkinson, J.</i> .....	407, 649
<i>Parratt, G. F.</i> .....	389
<i>Parrish, J.</i> .....	7
<i>Payne, E. J.</i> .....	145
<i>Peal, S.</i> .....	5
<i>Pellen, M.</i> .....	619
<i>Penney, H.</i> .....	545
<i>Perkins, J.</i> .....	447
<i>Perks, S.</i> .....	215, 216
——, W. ....	349
<i>Perreux, L. G.</i> .....	603
<i>Perroncel, F.</i> .....	334
<i>Perry, J.</i> .....	513
——, S. ....	79, 81, 101
<i>Peterson, R. E.</i> .....	295
<i>Phillips, M. H.</i> .....	313
——, R. ....	123
——, T. ....	540
<i>Physick, H. V.</i> .....	240, 410
<i>Pickersgill, J.</i> .....	39
<i>Pickett, J.</i> .....	516
<i>Pidding, W.</i> .....	176, 275, 279,
287, 297, 390, 539, 571,	658
<i>Piggott, W. P.</i> .....	125
<i>Pillans, J.</i> .....	535
<i>Pitman, J. T.</i> .....	642
<i>Platt, J.</i> .....	116
<i>Plummer, R.</i> .....	140
<i>Poole, M.</i> .....	49, 184, 191, 194,
195, 197, 198, 199, 200,	201,
202, 203, 204, 207, 369,	393,
511.	
<i>Popplewell, J.</i> .....	541
<i>Porteous, D. S.</i> .....	591
<i>Porter, J. F.</i> .....	376

	Page
<i>Potter, W. S.</i> .....	34
<i>Potts, F.</i> .....	583
<i>Préaud, J. M.</i> .....	591
<i>Price, G.</i> .....	381
<i>Prince, N. A.</i> .....	545
<i>Pritchard, W.</i> .....	14
<i>Provost, H.</i> .....	229
<i>Pulvermacher, I. L.</i> .....	652
<i>Pye, G.</i> .....	653
<i>Pym, J.</i> .....	292
<i>Racster, W.</i> .....	389
<i>Radcliffe, J.</i> .....	414, 483
<i>Radley, W.</i> .....	155
<i>Rankine, W. J. M.</i> .....	529
<i>Raper, N.</i> .....	50
——, T. N. ....	52, 53
<i>Raymond, M. T.</i> .....	350, 422
<i>Redgrave, W.</i> .....	400
<i>Rees, E. T.</i> .....	429
<i>Reid, R.</i> .....	608
——, W. ....	519
<i>Renfrew, R.</i> .....	510
<i>Restell, T.</i> .....	338
<i>Reynaud, C.</i> .....	631
<i>Riant, L. G.</i> .....	625
<i>Ricardo, J. L.</i> .....	131
<i>Rice, C.</i> .....	588
——, W. ....	332
<i>Richards, T.</i> .....	150
——, W. W. ....	182
<i>Richardson, B.</i> .....	646
——, G. ....	589
<i>Rickard, C. W. R.</i> .....	418
<i>Riddle, W.</i> .....	264
<i>Rider, E.</i> .....	192, 382, 625
——, I. ....	292
<i>Rimmel, E.</i> .....	521
<i>Rioux, P. F.</i> .....	567
<i>Ritchie, G.</i> .....	615
<i>Roberts, R.</i> .....	187
<i>Robertson, W. A.</i> .....	48
<i>Robinson, A.</i> .....	425
——, C. R. ....	95, 96
——, T. ....	420
<i>Robson, J. W.</i> .....	63
<i>Roe, F.</i> .....	197

	Page		Page
Rolfe, T. ....	636	Simpson, G. R. ....	657
Ross, G. ....	521	Sinclair, D. ....	556
Rotch, B. ....	28	—, J. ....	231
Rothwell, J. ....	247	—, The Hon. J. 510,	533
Roussel, S. ....	439	Skaife, T. ....	605
Rowett, W. ....	283	Skertchly, J. ....	328
Rowley, C. ....	226, 578	Skidmore, F. A. ....	506
Russell, F. ....	317	Slater, J. ....	225
—, J. J. ....	187	—, T. ....	231
Ruthven, J. ....	141	—, W. ....	464
Ryan, J. ....	546	Smith, J. ....	584
Ryder, J. ....	435	—, J. H. ....	229
—, W. ....	435	—, S. ....	527
		—, W. ....	540
Salt, T. P. ....	565	—, W. J. ....	515
Sautelet, E. C. F. ....	578	Sorel, S. T. M. ...	411, 568, 645
Scattergood, J. ....	359, 441	Soward, G. J. ....	122
Schelhorn, G. G. A. L. M. ....	601	Spencer, G. ....	181, 614
Schoofs, H. ....	559	Spill, G. ....	440, 650
Scott, G. L. ....	490	Spiller, T. ....	471
—, J. ....	268	Spooner, W. C. ....	333
—, J. E. ....	357	Staite, W. E. ....	288
—, U. 458, 550, 581,	604,	St. Andre, A. L. J. L. ....	340
	652	Stansbury, C. F. ....	493, 578
Scoutetten, H. J. ....	315	Statham, S. ....	583, 595
Scully, V. ....	593	Stather, J. ....	290
Selby, R. ....	368	St. Charles, P. P. D. ....	338
<i>Senèque, M.</i> ....	626	<i>Steinlen, C. V.</i> ....	599
<i>Shaler, R.</i> ....	607	Stidolph, W. ....	476
Shanks, A. ....	399	Stocker, A. S. ....	482
Shaw, G. ....	195, 601	—, S. ....	507, 562
—, S. ....	520, 526	Stoll, J. J. ....	226
Shearman, J. E. ....	630	Stoneham, J. J. ....	495
Shears, G. ....	577	Stones, R. ....	556
Shepard, E. C. ....	334	—, W. B. ....	150, 169
Sheppard, S. ....	593	Stott, S. ....	536
Sheringham, W. L. ....	259	Stuart, J. K. ....	443
Shipley, S. S. ...	319, 478, 535	Sutton, W. ....	1
Sibbald, R. J. ....	394	Swan, A. ....	140
Siemens, C. W. ....	436	Swinford, H. H. ....	546
—, E. W. ....	153	Sy, E. ....	278
Sievier, R. W. 30, 32, 35, 37,	52, 132, 166	Sylvanus, G. ....	2
Silbermann, I. J. ....	562, 569	Symington, W. ....	281
Simmonds, G. ....	9	Szontagh, S. ....	508
Simpson, D. C. ....	657		
—, G. ....	142	Tabberer, T. P. ....	161
		Tanton, J. ....	660

# INDEX.

11

	Page		Page
Tatham, J.....	102, 155, 212	Uttinger, M. ....	537
Taylor, C.....	642	Valls, L. ....	331
—, J. ....	151, 225, 364	Varicas, R. ....	54, 56
Taylor, J.....	89, 497, 607	Varlet, J. P. ....	462
—, J. G.....	352, 414, 642	Varroc, E. de.....	62, 360
—, J. H. ....	632	Vaughan, W. ....	359, 441
—, S.....	361	Vauthier, C. F. ....	518
—, T.....	239	Vero, J. ....	167
—, W.....	150, 388	Villiet, J. K. ....	294
Teague, H. ....	566	Vion, H. C. ....	264, 408
Tendall, H. ....	421	Vouillon, F. ....	430
Tenneson, H. Q. ....	43		
Terrett, R.....	525	Wacrenier, H. V. 571, 586, 588	
Theilar, M.....	468	Waithman, R. W. ....	402
Thomas, F. S. ....	379	Walker, H. ....	391
—, W. L. ....	525	—, J. ....	8, 114
Thompson, N. ....	509	—, R. ....	241, 648
Thomson, J.....	529	—, S.....	251
—, J. S.....	598	—, D. S. ....	128
—, W. ....	529	Wall, G. ....	502, 512
Thornton, A.....	262	Waller, R. ....	463, 465
—, B.....	586	Walles, J. ....	1
—, J.....	262	Walmsley, H. ....	280
—, W. C.....	586	—, J. ....	652
Thurlby, T. ....	421	Walton, F. ....	622, 660
Tizard, W. L.....	355, 356	—, J. ....	32
Tolhausen, A.....	587	Wansbrough, J. ....	401
Tomlinson, E.....	579, 585	Warburton, J. ....	588
Topham, C. ....	329	Ware, G. ....	247
Townend, C.....	75	Warren, P. ....	217
Travis, E.....	609	Watney, A. ....	90
Trotman, J.....	560	Watson, C. ....	252
Trotter, W. St. C. ....	421	—, H. ....	426
Trueman, E. T. ....	131, 585	—, J. J. W. ....	231, 415
Trumble, P. ....	428	Watt, C. ....	243
Tuck, J. H. ....	220, 501	—, W. ....	240
Turner, A. 60, 552, 621, 640, 650		Waygood, R. ....	411
—, E. R. ....	366	Weare, R. ....	447
—, L.....	621	Webly, P. ....	170
—, W. A. ....	597, 599	Webster, J. ....	622
Tussard, F.....	416	—, W. ....	611
Tyler, J. T.....	213	Weild, W. ....	533
Tylor, A.....	509	Weise, W. P. ....	19
—, H.....	82	Welch, E. ....	230
Tyrell, J.....	119	—, G. ....	638
Underhill, W. S. ....	643	Wells, G. ....	320



	Page		Page
Wells, J. H. G. ....	597	Wilson, G. F. ....	351
Welsh, J. ....	517	——, J. G. ....	256
Wertheimer, L. ....	471	——, T. ....	528
Westhead, E. ....	139	——, W. ....	658
——, J. P. ....	37, 122	Winiwarter, G. ....	274, 280
Wetterstedt, B. C. ....	26	Winslow, C. ....	661
Wetzlar, G. ....	62	Wolfen, J. J. ....	1
Wharton, W. ....	95	Wollowicz, A. ....	272
Wheeler, J. ....	3	Woodcock, T. ....	380
Whinery, R. ....	260	Woodley, J. ....	546
White, D. B. ....	413	Woodward, J. ....	337, 450
——, G. ....	548	Wright, C. ....	102
——, J. L. ....	506	——, E. P. ....	387
——, T. ....	530	——, J. T. ....	387
——, W. W. ....	653	——, S. B. ....	545
Whytock, P. ....	10	——, W. ....	70
Wickens, H. ....	425, 489	Wyld, O. ....	2
Wild, C. H. ....	63	Wylde, J. ....	150
Wilkinson, W. 252, 257, 279,	375	Yates, T. C. ....	477
Wilks, H. ....	302	Yeadon, S. ....	615
Williams, M. ....	534	Youel, J. ....	507
——, T. R. ....	87	Zahn, W. H. ....	597
Willis, E. C. ....	453		
Willson, E. J. ....	413		

INDIA RUBBER AND GUTTA PERCHA:  
AIR, FIRE, AND WATER-PROOFING.

---

A.D. 1627, December 8.—N<sup>o</sup> 40.

WOLFEN, JOHN JASPER.—Grant “for and during the terme  
“ of fourteene yeres” “to vse or e<sup>x</sup>cise, practize or putt in vse,”  
“ a newe inven<sup>co</sup>n for the making and p<sup>re</sup>paring of <sup>e</sup>taine stuffe  
“ and skynns to hould out wett and rayne;” and to “make, frame,  
“ sett vpp, or vse all such engynes, instrumentes, and deuises” as  
the patentee shall have found out or discovered, “to p<sup>ro</sup>poses  
“ aforesaide,” on payment of the “yerely rente of five poundes of  
“ lawfull money of Englande.”

[Printed, 3d. No Specification enrolled.]

A.D. 1634, December 19.—N<sup>o</sup> 77.

EYRES, JOHN, MOWATE, CHARLES, and WALLEES, JOHN.—  
Grant for “the terme of fowerteene yeares” “of full and free licence  
“ priviledge, power,” &c., “to vse, exercise, practice, and put in  
“ vse” “seacret waies and meanes not heretofore used within any  
“ of our domynions, whereby to make wollen cloth impenitrable,  
“ of rayne, which would be very co<sup>m</sup>odious for our subiecte,  
“ as well for journeying and the s<sup>er</sup>vera<sup>co</sup>n of their healthe; as  
“ also for saving of much leather that nowe is wasted in covering  
“ of coaches and waggons, for that the said covering of clothe  
“ will keepe out wet as well as a covering of leather, and will be  
“ lighter for horses to travaile withall,” on payment of the  
“ yearelie rent or s<sup>u</sup>me of tenne poundes of lawfull Englishe  
“ money.”

[Printed, 4d. No Specification enrolled.]

A.D. 1691, September 15.—N<sup>o</sup> 275.

SUTTON, WILLIAM.—Grant for fourteen years of “special  
“ lycence, power,” &c., to “erect, vse, teach, exercise, and put in

2 INDIA RUBBER AND GUTTA PERCHA:

“ practice” the “new and extraordinary art or invention of ordering  
“ all sorts of linnen and woollen cloathes, and other manufactures  
“ thereof, and all sorts of stufes, silks, hatts, and leather soe as  
“ to make them hold out water, and alsoe for preventing of  
“ woollen cloaths, manufactures, and hatts from moths and mill-  
“ dewe.”

[Printed, 3d. No Specification enrolled.]

A.D. 1693, April 22.—N<sup>o</sup> 322.

SYLVANUS, GEORGE.—Grant for fourteen years of “especiall  
“ lycence, power, priviledge,” &c., “to erect, vse, teach, exercise,  
“ and put in practise” the invention of “a new and extraor-  
“ dinary mixture of wax and other ingredients, known by the  
“ name of the German balls, which are of great vse for beautifying  
“ and preserving any sort of leather, and being vsed for coachea  
“ will preserve the same much better and longer than anything  
“ now vsed, and prevent any wett entering into boots and shoes.”

[Printed, 3d. No Specification enrolled.]

A.D. 1735, March 17.—N<sup>o</sup> 551.

WYLD, OBADIAH.—“Making or preparing paper, linnen, can-  
“ vass, and such like substances, which will neither flame nor retain  
“ fire, and which hath also a property in it of resisting moisture  
“ and dampes,” “by mixing allom, borax, vitreol, or copperas  
“ dissolved and beat up with the pulpy substance before ’tis  
“ formed into paper, and when the paper is dried, to dip it into  
“ a thin size made warm. And the method whereby paper  
“ already made, as also linnen, canvass, and such like substances,  
“ are prevented from flaming or retaining fire, is by dipping them  
“ into a strong infusion of the aforesaid materialls in water or  
“ thin size made hot; but if only water is used in the first  
“ dipping they must, when dry, be dipped in a thin size. And  
“ the method whereby paper, linnen, canvass, and such like  
“ substances so prepared as aforesaid are made to resist moisture  
“ and dampes, is by mixing drying oyl with the size in the last  
“ dipping, or by pressing or laying the paper, linnen, canvass, and  
“ such like substances between other paper, pasteboards, or  
“ cloths, moistened with drying oyl, or by moistning the said

**AIR, FIRE, AND WATERPROOFING.**

3

“ paper, linnen, canvass, and such like substances with drying  
“ oyl.”

[Printed, 3d. See Rolls Chapel Reports, 6th Report, p. 155.]

A.D. 1748, June 27.—N° 632.

WHEELER, JOSHUA.—“ To prepare woollen cloath and hatts so  
“ so as to render them capable of keeping out much more than a  
“ day’s or a week’s rain, without impairing either the beauty or  
“ strength of the cloath or hatts.” “ Stretch the cloth in a  
“ frame, and spread on the wrong side of it as much bees’-wax as,  
“ when forced in by heat, will penetrate half through the cloth’s  
“ thickness; then take one pound of bees’-wax, half a pound of  
“ yellow rosin, two ounces of Strasburgh turpentine, and melt  
“ them together, to which add as much oyl of rosemary as will  
“ overcome the smell of the above ingredients, of which spread,  
“ as before, such a quantity as will, by heat, force through three-  
“ fourths of the cloth’s thickness.” The same preparation, with  
“ as much ivory black as is sufficient to colour it, to be in like  
“ manner forc’d by heat, will prepare hatts for the purpose  
“ aforesaid.”

[Printed, 3d. See Rolls Chapel Report, 6th Report, p. 123.]

A.D. 1763, April 1.—N° 788.

ELMSLEY, SAMUEL.—“ A preparation called waterproof, whereby  
“ to prevent rainwater from penetrating woollen cloths and hats.  
“ To a gallon of river water put a pound of rock allom, two  
“ ounces of isinglass, two ounces of argal, two ounces of cream of  
“ tartar, dissolved separately in water; let these ingredients be  
“ mixed together, and therein (moderately warm) steep the cloth  
“ or hats for forty hours, more or less.”

[Printed, 3d. See Rolls Chapel Reports, 6th Report, p. 133.]

A.D. 1790, January 15.—N° 1721.

HUNCLASS, SAMUEL YOUNG.—“ A method of making and  
“ rendering elastic and waterproof all sorts of painted, printed,  
“ varnished, or japanned linnen, cotton, woollen cloths, stuff, or  
“ silk, or any other material interwoven therewith.” This inven-  
“ tion consists, first, in certain “ compositions” with which the  
“ material operated upon is to be coated. The first “ composition”

#### 4 INDIA RUBBER AND GUTTA PERCHA :

is composed of "copal oil varnish, quince oil varnish, amber oil varnish, or black japan oil varnish, together with lamblack or umber, pulverized and ground with any kind of raw drying or ethereal oil for grinding colours," to which add "prepared boiled or drying linseed oil," in sufficient quantity to reduce it to the thickness of common house paint. The second composition consists of "verdigris, lamblack, Prussian indigo, or other blues, each an equal quantity, to which add a tenth part of such quantity of gold or silver litharge, or of copperas, or of sugar of lead, ground in any oils that are used for grinding or mixing with colours;" to which add "jappenners gold size, or black japan, or copal varnish, or annamee varnish, or amber varnish," together also with "boiled or lintseed oil" in sufficient quantity to make it work. Third composition consists of any kind of "spirit varnish," "baroch varnish," to which is added "any colours of oakers, or of umber, burnt or raw, or of any other colours ground with turpentine, or turpentine varnish." Fourth composition is compounded of "common black or Burgundy pitch, or black or white rozen, and vitriol," boiled together, to which is then added a sufficient quantity of "oil of coal, or coal varnish." Fifth composition is compounded of "tar, oil of Jerran, or india lacker, spirit of wine lackers. Canadia balsam, baroch or any other varnish, india ink, yellow coloured resinous gum, imported from Port Jackson," all boiled together.

The invention consists, secondly, in "the method of laying on the said compositions." This may be effected by brushing the "compositions" on to one side only of the material while stretched in a frame, and repeating the coatings as often as may be required. After each coating the material should be pressed and smoothed on the uncoated side by a suitable instrument, and allowed to dry. When it is required to have "the material prepared in such a manner that one side thereof may remain nearly in its original state," that is to say, uncoated with "composition," the patentee, by means of a brush, covers that side, first with two coats of size and whiting, or with a solution of "glue," with "whiting, or water white, or umber, or oaker, or white lead;" or with a solution of "gum arabick, or india glew, or isinglass, or gum senega, or roland, or other starch, or paste, or wheaten or any other flour, or lintseed, or lintseed cake, or strong water varnish;" and when these coatings are dry he then

proceeds to apply the "composition" to the other side, as above described. When the coatings of the composition are also dry, the glue, gum, paste, &c., may then be removed by means of a sponge and warm water.

[Printed, 3d.]

A.D. 1791, May 2.—N° 1801.

PEAL, SAMUEL.—"An improved method of making and rendering perfectly waterproof all kinds of leather, cotton, linnen, and woollen cloths, silks, stuffs, paper, wood, and other manufactures and substances, for the purpose of being worked up into shoes, boots, and other wearing apparel, and to be used on all occasions where dryness or a power of repelling wet or moisture may be required." "Take caoutchouc or (what is called in this country) elastic gum or india rubber; dissolve the same by distillation, or by infusion in a small quantity of spirits of turpentine, over a brisk fire; it may also be dissolved by infusion in other spirits, and in most kinds of oils; or the gum may be used with equal advantage in its native fluid state. The gum thus prepared, or in its native state, is to be applied to the hide, skin, leather, cloth, silk, or any other article or manufacture intended to be rendered waterproof by means of a brush or other utensil capable of giving a regular thin coating. Place the hide, &c., in a hot room or stove till it becomes nearly dry; then lay on another coating in the same manner, which application is to be repeated several times, according to the substance of the article or manufacture, and the use for which it is intended, observing, that after it has received its last coating it must remain in the hot room or stove till it is perfectly dry."

[Printed, 3d.]

A.D. 1794, January 9.—N° 1975.

BELLAMY, JOHN.—"An improved method of making all kinds of leather and various other articles waterproof, for the purpose of being made up and used in a variety of necessary articles of consumption." These improvements consist, first, in a preparation made by the admixture of "nut oil," "poppy oil," "linseed oil," or any other drying oil, and "essential oil of turpentine," in such proportions as may be found in practice to

## 6 INDIA RUBBER AND GUTTA PERCHA :

be best, to which is added a suitable quantity of umber or white copperas, sugar of lead, colcother, or any other proper drier, or any proper mixture of them ; the whole is then heated to a high degree for several hours. Second, in a preparation consisting of the above prepared oils, to which is added gum resin, pitch, tar, and turpentine, or gums, sandarac, mastac, animny, copal, amber, together or separate ; or asphaltum or Jew's pitch, or bees'-wax, birdlime, or any bituminous, resinous, glutinous, oleous, or adhesive matters (except the gum commonly called elastic gum or india rubber) which will resist acids, alkalies, and water, and that will unite with drying oils, in such quantities of all or any of them as may be found most suitable. The third part of this invention consists in the application of these preparations "to leather or other articles." This may be effected by rubbing or brushing the preparation before it is cool into the leather, &c., removing the excess with a scraper, and finally drying the material in a warm room.

[Printed, 3d. See Repertory of Arts, vol. 1, p. 73.]

A.D. 1797, July 26th.—N° 2188.

JOHNSON, HENRY.—"A certain waterproof compound, and a vegetable liquid, which liquid is for the purpose of bleaching, whitening, and cleansing woollens, linens, cottons, and other articles ;" "and also for preparing stuffs or cloths made of woollen, linen, cotton, or silk, in order, by the application of the aforesaid waterproof compound to render them impenetrable to wet, and more elastic and durable when made into garments, &c. for wear, and which stuffs or cloths I call hydrolaines." The bleaching liquid referred to is an immulsion or imperfect soap, made from horse chesnuts, orange peels and kernels, offals and galls of fish, or either of them ; British barilla, kelp, wood ashes or pearl ashes, and Reigate lime. To a solution of such substances is added oil which has been "incorporated with water," by being boiled in it, with the addition of a small quantity of salt of sorrell, salt of sugar, or rectified salt of tartar."

Secondly, as regards the "waterproof compound," the patentee's process is as follows :—"After the linen, woollen, cotton, or silk stuffs, or cloths, hats, or leather are prepared by the above-described 'blanching lixivium,' I stretch them in a frame, and having dissolved caoutchouc or india rubber in spirits of turpentine (the smell of which is taken off by oil of wormwood)

“ and spirits of wine in equal quanties, the caoutchouc (having become a varnish) I spread with a large piece of the undissolved caoutchouc (instead of a sponge or brush) upon the wrong side of the prepared stuff, or cloth, or leather, and then sift over it any colour cloth, or silk, or worsted, or cony, or other wool, cut fine, in the same manner as flock paper is made, and being let to dry for a day or two, this flock, by its adhesion to the caoutchouc is equal to any lining.”

[Printed, 3d. See Repertory of Arts, vol. 9, p. 310.]

A.D. 1797, October 31.—N<sup>o</sup> 2199.

PARRISH, JOHN.—“ A certain art or method of rendering all kinds of woollen cloth, stuffs, hats, and other articles impermeable to moisture or wet, or waterproof, so as to render even the finest sorts in a condition to resist rain in every situation and for any length of time, without in the least degree affecting their beauty, colour, or wear.” “ I combine aluminous earth with the metallic parts of a supersaturated solution of tin and the colouring atoms of the reseda major, applying such a portion of this combination as the substance of the cloth requires, in water, about six degrees below a boiling heat, in which the cloth must be immersed half an hour, when the combined resisting principles become so firmly attached to the animal oil of the wool as to occasion the cloth to resist rain and be fully waterproof as long as it remains whole.”

[Printed, 3d.]

A.D. 1800, September 15.—N<sup>o</sup> 2442.

HITCHCOCK, JAMES.—“ Changing and converting skins of parchment and vellum into leather, and of making such leather waterproof.” The first part of this invention consists in treating skins (for the purpose of converting them into parchment or vellum leather) with a solution of white copperas mixed with salammoniac, cream of tartar; then with diluted spirits of marine salt, spirits of nitre, and oil of vitriol; then steeping them in a decoction of oak bark, elm bark, lignum vitæ chips, sarsafra, and shumack; and, finally, with a weak solution of oak bark or with shumack. The “ parchment or vellum leather ” thus prepared is rendered waterproof as follows :—“ It must be soaked for five or six days in nut or linseed oil, then taken out and wrung as



8 INDIA RUBBER AND GUTTA PERCHA:

“ dry as possible, after which it must (being first stretched on a board or other flat surface) be spread, with a wooden or metal tube made for the purpose, or brushed over several times with the following composition:—Take one pound of red lead, one pound of litharge, one pound of copperas, one pound of sugar of lead, one pound of rosin, and one pound of bees'-wax, and one pound of pitch; put them into seven gallons of linseed, nut, or fish oil, and boil them in an iron or earthen pot until it becomes the consistence of treacle, which when cold may be spread with an iron or wooden instrument upon the surface of the leather, or brushed on when warm, or spread, when cold, for three or four times, which will be sufficient; then suffer it to dry for three or four days, and it will be fit for use.”

[Printed, 3d. See Repertory of Arts, vol. 5 (second series), p. 260.]

A.D. 1801, April 28.—N° 2491.

ACKERMANN, RUDOLPH, and CUTTEAU, PETER JAMES.—“ For a new improved method of rendering all sorts of woollen cloths, cotton, linen, silk, hats, paper, and other manufactures and substances, perfectly waterproof, and so as to be used on all occasions where a power of repelling rain, wet, or moisture may be required.”

[No Specification enrolled.]

A.D. 1801, November 3.—N° 2547.

WALKER, JOHN, and ALPHEY, GODFREY.—“ Making and manufacturing caps and hats, and rendering them perfectly waterproof, as also all kinds of leather, silk, linen, cotton stuffs, pasteboard, and other manufactures and substances, for the purpose of being worked up into boots, shoes, gaiters, women's hats or bonnets, and other wearing apparel, so as to be used on all occasions where a power of repelling wet or moisture may be required.”

That part of this Invention which relates to “waterproofing,” consists in painting the material operated upon “on both inside and outside with any kind of oil, paint, or oil and lampblack, which latter is greatly to be preferred, with one or more coats, as circumstances may require. When this is dry it is then to be covered with one or more coats of japan or varnish, mixed with lampblack or ivory black.”

[Printed, 3d. See Repertory of Arts, vol. 16, p. 217.]

A.D. 1802, April 2.—N° 2603.

DUKE, ELIZABETH, and JACKS, JAMES (*a communication from a person residing in America*).—"A new invention whereby " they are enabled to render all sorts of woollen, cotton, and linen " cloths, canvas, silk, hats, paper, and other manufactures water- " proof."

[No Specification enrolled.]

A.D. 1804, May 19.—N° 2765.

SIMMONDS, GEORGE.—"A method of manufacturing hats, " bonnets, and other useful articles, of paper, and of rendering " the same waterproof when required." That part of this invention relating to "waterproofing" consists in "dressing" over with "spirit varnish" the articles manufactured from paper, whether that article be a platted hat or bonnet, or a ladies' dressing box made of platted paper, work baskets, table mats, or other useful and ornamental articles, and whether white, dyed, or stained, or being made of sheets of paper, squares, or platt. The coatings of varnish are repeated until the article becomes waterproof.

[Printed, 3d. See Rolls Chapel Reports, 6th Report, p. 202.]

A.D. 1805, January 23.—N° 2814,

MOLLERSTEN, CHARLES FREDERICK.—"A chemical composition and method of applying the same in the preparation of " hides, skins, and leather, silks, taffetas, and linen, and to all " articles already made of skins and leather, thereby colouring " and giving a beautiful gloss to the same, rendering them water- " proof and impenetrable to hot or corroding liquids, and at the " same time preserving them from decay, and keeping them soft " and pliable." The "chemical composition" referred to may consist (if for a black) of "two gallons of linseed oil, one gallon " whale oil, and one half pound of horse grease; mingle them " with four pounds of fine ground Prussian blue, and four pounds " of lampblack, and afterwards boil them on a strong fire; to " which add one pound of fine ground benzoin gum, previously " well mingled in one gallon of linseed oil, of which one half " gallon is put in the above when the composition has boiled one " half hour, and the residue when it is sufficiently boiled and " ready." For other colours the linseed oil should be bleached.

10 INDIA RUBBER AND GUTTA PERCHA :

For a blue, add spermacetti oil to the linseed oil and Prussian blue, and "place them in a glass vessel in a strong sun, (the "effect is increased by burning glasses if necessary,)" till the mixture acquires the proper consistency, then add the gum benzoin and linseed oil as before. "The colours used are those composed "of metallic and animal parts, or metallic only."

The "method of applying the same" consists as follows:—The leather or fabric being stretched on a board covered with woollen blanket, is thinly coated with the composition by the hand or by means of iron scrapers, and put into the oven to be dried, and when withdrawn is well rubbed with pumice stone. This may be repeated six times. The oven preferred should be "nine feet in length, six feet in breadth, and four or five feet in "height," with two iron doors in front as large as the opening. The fire is placed underneath, and the oven is surrounded with flues.

[Printed, 3d. See Repertory of Arts, vol. 7 (*second series*), p. 165; and Rolls Chapel Reports, 7th Report, p. 189.]

A.D. 1806, March 8.—N° 2913.

WHYTOCK, PATRICK.—"An improvement in the manufacture "of piece goods composed of cotton, of flax, or of hemp, or of "any mixture or mixtures of two or more of those articles, by "which such goods will resist the rotting action of wet or moisture much better than similar fabrics manufactured by the "methods in common use." This invention consists in the application to fabrics and to other articles mentioned, such as sails, cordage, ropes, &c., for the above purpose, of the "oxides, "calces, or solutions of quicksilver" or of "copper." The patentee prefers to use the "red oxide" of quicksilver, which may be mixed with the starch used by the weaver for smoothing his threads in the proportion of eight or ten ounces to the cwt. of cloth, or may be mixed with tar and applied to the yarns. The oxide of quicksilver, being insoluble, does not wash away, as would a soluble salt, and preserves the article to which it is applied "from mouldiness or mildew."

[Printed, 3d.]

A.D. 1807, January 29.—N° 3003.

HANCE, WILLIAM. — "A method of rendering waterproof "beaver and other hats." This invention, in so far as it relates

to "waterproofing," consists in applying to the "underneath side of the shell," and to the "inside of the crown," of "hats made of wool, hair, and fine beaver," "dyed black," and "finished without any glue or stiffening of any sort," "a coating of size or thin paste or any other proper substance that will be sufficiently strong to bear a coat of copal varnish, and when thoroughly dry another coat of boiled linseed oil, very strong; when sufficiently dry and hardened the crown must be put on a block, and a willow or cotton body or shape, wove on purpose, put into the inside of the crown, and cemented in."

[Printed, 3d. See Repertory of Arts, vol. 10 (*second series*), p. 423; and Rolls Chapel Reports, 7th Report, p. 196.]

A.D. 1813, July 14.—N<sup>o</sup> 3718.

CLARK, JOHN.—"A method for making or constructing beds, pillows, hammocks, cushions, and other articles of the like kind, &c." This invention consists, first, in rendering "the case of the bed, pillow, bolster, hammock, cushion, or pad impervious to air;" secondly, in strengthening the said case by enclosing it in another [but smaller] case, which said external case need not be impervious to air;" thirdly, in filling the internal case with common atmospheric air instead of down or feathers or other materials hitherto used." The patentee states that numerous methods of rendering the inner case airtight may be adopted; such as constructing it of "such suitable substance or substances as are of themselves air-proof, or otherwise covering it with any composition which is, when dry, elastic, pliable, and impervious to air." But the method which he proposes to adopt is described as follows:—"To one ounce of caoutchouc (usually called elastic gum or india rubber), cut in small pieces, add eight ounces of spirit of turpentine; let it stand inclosed in a glass vessel for two or three days, or until the caoutchouc be considerably distended, and almost in a state of solution; then throw the whole into an open or uncovered furnace or vessel containing seventy ounces of linseed oil, and boil it slowly for several hours, stirring it frequently until the composition becomes of a thick, glutinous consistency; then let it cool, and filter it through a fine cloth." "When this said composition is used it must be made rather warm, and the said internal case of the bed, &c. must be immersed in it until completely saturated therewith; it must then be extended by cords and loops attached to its corners, and exposed to a

## 12 INDIA RUBBER AND GUTTA PERCHA :

“ current of air in a shady place, and sheltered from the weather, turning it frequently to prevent the composition from draining off until dry. Another covering of the said composition must then be added by means of a flat hair brush ;” and this can be best effected when the case is distended with air by means of an air pump. The “ composition ” will dry more quickly if a current of air be caused to pass into the case by one aperture provided with a stopcock, and out at a second aperture similarly provided. “ When the case is quite dry it must be washed in fair water, wherein if any air bubbles arise from the case, they will indicate the exact place of the leak or leaks ;” and such defective parts must be afterwards retouched with the composition. “ This said case may afterwards, if required, be covered with leaf gold merely by laying the sheets of leaf gold on it, and greatly pressing them down.”

[Printed, 3d. See Repertory of Arts, vol. 24 (second series), p. 157 ; and Rolls Chapel Reports, 8th Report, p. 97.]

A.D. 1816, February 20.—N° 3984.

BAYNHAM, WILLIAM.—“ A composition for making leather and other articles waterproof.” “ This composition is compounded of 6 gallons of linseed oil, 1½ pounds of rosin, and 4½ pounds of red lead, litherage, or any other substance usually known under the denomination of dryers, which are to be boiled together till they acquire sufficient consistence to adhere to the finger in strings when cooled upon a bit of glass or otherwise ; it is then to be removed from the fire, and, when sufficiently cooled, thinned to about the consistence of sweet oil with spirits of turpentine, of which it generally takes about 6 gallons. It is then left to settle for a day or two, when it is carefully poured off from the grounds, and about 1½ pounds of ivory or lampblack, and 1½ pounds of Prussian blue, ground in linseed oil, added to and intimately mixed with it. It is then ready to be used as follows :—On any description of leather, cloth, or other articles, having stirred up the liquid, lay it on with a brush until it bears out with an even gloss ; then hang up the subject acted upon until the next day, when repeat the application as before, taking care to leave the surface thin and even as possible, and so on each successive day until it has the desired appearance.”

[Printed, 3d. See Repertory of Arts, vol. 29 (second series), p. 338 ; and Rolls Chapel Reports, 8th Report, p. 113.]

A.D. 1816, November 1.—N° 4074.

DICKINSON, GEORGE WASHINGTON.—“ New or improved  
“ method, means, or contrivance for preventing leakage from  
“ vessels employed to contain liquids, and for the preventing the  
“ admission of moisture into packages or vessels intended to be  
“ kept dry within.” “ I construct the outside (of the vessel) of  
“ wood, and fit into it a vessel of iron, or I line it with iron, or  
“ with canvas, cotton, linen, or silk cloth, or with leather or  
“ skins, the lining of canvas, cotton, silk, leather, or skins being  
“ properly impregnated with or covered over with varnish, the  
“ nature and kind of varnish being suited to the article to be  
“ contained in the said vessel, (Lord Ribblesdale’s rock cement  
“ mixed with boiled oil being preferred,) and further, when the  
“ inside is of iron, I give the said inner vessel or lining a flanch  
“ projecting inward, on which the iron cover rests, and to which  
“ it is made fast by means of screws and nuts, a gasket of hemp  
“ or cotton being previously interposed. When the lining is  
“ of cloth of any description, or of leather, or of skin, I make  
“ the lining lap over on the edge of the wooden vessel (suppose a  
“ common packing case), and the lid or cover being covered with  
“ the same material, I interpose between the vessel and its cover,  
“ before fastening down the cover with a gasket of hemp or  
“ cotton, or a strip of leather or of cloth, of any suitable material  
“ and thickness, and when it may be thought advisable for  
“ further security, I impregnate the said gasket with the varnish  
“ employed for impregnating or covering the lining of the vessel;  
“ but for some purposes, when a lining of cloth of any kind is  
“ preferred to iron, I make the lining into what may be called a  
“ bag, of a form answerable to the outer case, but of such a  
“ greater depth as may allow the mouth of the bag to be drawn  
“ together and properly secured by tying it up before fastening  
“ on the cover.”

[Printed, 3d. See Rolls Chapel Reports, 8th Report, p. 116.]

A.D. 1818, May 5.—N° 4255.

BENJAMIN, WOLF.—“ A composition varying in colour with a  
“ peculiar method of applying, for the purpose of rendering canvas,  
“ linen, and cloth durable, pliable, free from cracking, and water-  
“ proof, and also for preserving every kind and description of wood  
“ from wind or weather, whether applied to ships, houses, or manu-

“ factories, and for all purposes where paint, varnish, or tar are used  
 “ for the purpose of preservation or beauty, and whether applied  
 “ to cannon, or iron of every description.”

This invention consists in coating the article operated upon with two or more coats of a varnish, the basis of which is “boiled linseed oil.” The ingredients used will vary in proportion according to the relative strength of each. For a “black” the patentee uses “boiled linseed oil,” “burnt umber,” “sugar of lead,” “white vitriol,” “white lead,” and “lampblack,” properly mixed together and boiled in an iron vessel. The first coating of varnish is applied with a brush, and the second coating should be made with the same varnish, but containing “no white lead.” The varnish for the third coating is compounded of “boiled linseed oil,” “burnt umber,” “sugar of lead,” “white vitriol,” “Prussian blue,” “verdigrase,” and lampblack,” boiled together as before. “Lead color” may be prepared by adding to the above black “white lead” to shade desired. “Green” may be prepared by mixing “yellow ochre,” “Prussian blue,” “white lead,” “white vitriol,” “sugar of lead” with “good boiled linseed oil.” “Yellow” is obtained by “yellow ochre,” “burnt umber,” “white lead,” “white vitriol,” “sugar of lead,” and “boiled linseed oil.” “Red” is obtained by “vermillion,” “white vitriol,” “sugar of lead,” and boiled linseed oil.” “Grey” may be produced by adding “Prussian blue” to “white lead.” And, finally, “white” may be produced by “white lead,” “spirits of turpentine,” “white vitriol,” “sugar of lead,” and “boiled oil.”

[Printed, 3d. See Repertory of Arts, vol. 35 (*second series*), p. 277; and Rolls Chapel Reports, 8th Report, p. 123.]

A.D. 1820, March 18.—N<sup>o</sup> 4439.

PRITCHARD, WILLIAM, and FRANKS, ROBERT.—“Manufacturing waterproof hats.” The Specification of this invention contains the technical details of hat making necessary in the application of the following waterproof cement:—

“Take what is called a shell, that is, a hat made with beaver  
 “or any other materials used in the hat manufactory, but not  
 “any nap underside. When dyed and dry, take the following  
 “waterproof composition:—One pound of gum kino, eight  
 “ounces of gum eleuse, three pounds of gum olibanum, three  
 “pounds of gum copal, one pound of gum ladanum, two pounds

“ of gum juniper, one pound of gum mastick, and ten pounds of resin shellac, and eight ounces of common frankincense. Let these ingredients be bruised as small as possible, and put into a well glazed earthen vessel; then pour three gallons of alcohol upon the ingredients, taking care to mix it well; then put the vessel (closely covered) into a water bath, of the temperature of one hundred and seventy-six of Farenheit for about two hours. Put into the vessel one pint, wine measure, full of liquid ammonia, one ounce of oil of lavender, and one pound of gum myrrh, and gum opopnox, previously dissolved in three pints of proof spirits of wine, and let the whole be well agitated. With this stiffen the underside, according to the substance required,” and form the hat in the manner described in the Specification.

[Printed, 3d. See Repertory of Arts, vol. 40 (*second series*), p. 138; and London Journal (*Newton's*), vol. 1, p. 408.]

A.D. 1820, April 29.—N<sup>o</sup> 4451.

HANCOCK, THOMAS.—“ An application of a certain material to various articles of dress and other articles, that the same may be rendered more elastic.” The object of this invention is the application of “caoutchouc” for the purpose of making a better kind of spring than any now in use for certain articles. The caoutchouc (previously steeped in hot water when required) should be cut into slips of a convenient length and thickness to ensure the required degree of elasticity. The strip of caoutchouc may be enclosed in a “case or pipe of leather, linen, or cotton, or other similar material, made as long as it is necessary the spring should stretch. The spring is then fastened at the extremities of the pipe or case, by sewing, or otherwise in such a manner as that the pipe may contract or gather up very considerably.” Springs so made may be applied to the “wrists of gloves,” “waistcoats,” “waistbands,” “coat sleeve linings,” “the mouths of pockets,” “trowser and gaiter straps,” “braces;” “to stockings, to prevent their slipping down the leg,” “garters,” “shirt wrists,” “to the knees of drawers,” and “breeches,” “wigs,” “false curls,” and “fronts,” “pocket-books,” “purses,” “riding belts,” “stays and other parts of women’s apparel;” to “boots,” “shoes,” “clogs,” and “patten, when the object is to take them off and on without any unlacing or tying;” to “stiffners for neckcloths,” or “to any



16 INDIA RUBBER AND GUTTA PERCHA :

“ other article of dress when elasticity is desirable at any particular part.”

The patentee applies caoutchouc also “ to the soles of boots, shoes, and clogs, by making either the whole sole of caoutchouc or the inner or outer sole only, or by fastening a piece of caoutchouc between the soles;” also to the bottom of “ stirrups” to render them elastic to the foot.

[Printed, 3d. See Repertory of Arts, vol. 40 (*second series*), p. 14; and London Journal (*Newton's*), vol. 2, p. 7.]

A.D. 1822, April 16.—N° 4668.

COOK, BENJAMIN.—“ A certain mixture or preparation, which may be used with advantage in preventing the danger of accidents from fire.” For this purpose, the patentee claims “ the application of the fixed alkaline solution in [for] preventing all accidents from fire to callicos, cottons, silks, muslins, cloth, and linen of every description, bed and window curtains, and sail cloths, as well as to woodwork of all sorts, either in buildings or vessels of any description; and in the case of timber, to prevent the dry rot.” The patentee prefers to use “ the pure fixed vegetable alkali,” which should be dissolved in soft water, and applied by steeping the material under treatment in a clear solution of the alkali, or by brushing or coating the solution over its surface. The required strength for fabrics may be ascertained by adding alkali to the water until cotton, paper, or linen dipped into it, and dried, will not blaze. In preparing timber with this solution, the patentee also proposes to extract or force out, “ by means of an engine,” the sap from trees while the bark is still on, and then “ to saturate the whole by forcing the alkali through all the pores of the tree, after which it may be barked, and sawed up into planks when required.” Fabrics, fibrous materials, or timber, so treated, will char by intense heat, but not burst into flame.

[Printed, 3d. See Repertory of Arts, vol. 44 (*second series*), p. 267; and London Journal (*Newton's*), vol. 5, p. 235.]

A.D. 1823, May 10.—N° 4790.

CASLON, WILLIAM, the younger.—“ Certain improvements in the construction of gasometers;” and these improvements are, “ constructing gasometers of light materials, with flexible sides, so as to dispense with water in their operation, and no tank being

" required." A light wooden frame is fixed, and the lower part and bottom is covered with cloth, or other suitable material, painted with boiled linseed oil, or other elastic composition, so as to form the bottom and sides of an air-tight vessel. A moving frame, hung by ropes or chains over pulleys, is suspended over this fixed frame, and is made less in diameter than it, so as to pass into it. The lower part of this moving frame is covered with air-tight cloth, and suspended all round the bottom; the lower edges of this cloth are attached closely to the fixed frame when the same is covered with the cloth, and thus is formed an air-tight chamber. The gas passing into this chamber elevates the suspended frame, and passing out lowers it.

[Printed, 6d. London Journal (*Newton's*), vol. 7, p. 21.]

A.D. 1823, May 31.—N° 4796.

MILLS, JOHN, and FAIRMAN, HERMAN WILLIAM.—" Improvements in rendering leather, linen, flax, sail cloth, and certain other articles waterproof." These improvements consist in rendering such articles impervious to water. while at the same time they will retain their elasticity, and be free from stickiness, by means of the application of the following composition :—" Linseed oil at the rate of one hundred pounds, 6½ lbs. of sacharum saturni, 1½ lbs. burnt umber, 1½ of white lead, 1 lb. of fine pumice stone (all these articles being previously well pounded and ground), and boiling the whole together for ten hours over a slow and regular fire;" it is then withdrawn from the fire and allowed to settle for a week, and strained. " A quantity of pure pipe clay, equal in weight to one third of the clarified varnish," is then beat up " with so much thin glue water, till it comes to the consistency of a thin salve, after which the varnish is likewise gradually added," and the whole well stirred, and ground to a thin liquid. Any colour may then be given to this composition by incorporating with it the refined " oil color." The composition so prepared is spread on one or both sides of the linen, leather, or other article, while extended on wooden frames, by means of " large knives;" and when the linen, &c., has been hung up till dried it may then receive a gloss or lacker by the application, by means of brushes or otherwise, of two or more coatings of the composition, as follows :—" 50 lbs. of the above varnish is gently boiled with 5 lbs. of clarified rosin, until the

18 INDIA RUBBER AND GUTTA PERCHA:

" rosin is dissolved, and when cooling 2 lbs. of turpentine added  
" to it," and colour, if desired, corresponding with that already  
on the article may be added.

[Printed, 3d. See Repertory of Arts, vol. 46 (*second series*), p. 209; London  
Journal (*Newton's*), vol. 6, p. 119; and Register of Arts and Sciences,  
vol. 2, p. 299.]

A.D. 1823, June 17.—N° 4804.

MACINTOSH, CHARLES.—" A process and manufacture where-  
" by the texture of hemp, flax, wool, cotton, and silk, and also  
" leather, paper, and other substances may be rendered imper-  
" vious to water and air." The patentee prepares a solution by  
depositing thin shreds or parings of caoutchouc in " the substance  
" which is produced in making coal gas, commonly called coal  
" oil," the relative proportion employed depending on the quality  
of each article. Fabrics or substances effectually united by cement  
" thus prepared, in whatever way the union is effected, become  
" both air and water proof. But with a view to prevent the  
" cement from appearing upon the surface of the manufactured  
" article, and to insure at the same time a perfect union of the  
" substances, I, in the first place, distend the substances to be  
" united, and with a brush or other suitable instrument lay upon  
" the surface of each an uniform layer or coating of the varnish  
" or cement; and when this coating has from evaporation of the  
" oil, which is extremely volatile, acquired a clammy viscous  
" consistency, (and this will take place in a shorter or longer  
" space, in proportion to the heat of the atmosphere and the cur-  
" rent of air in which the manufacture is carried on, or to which  
" the coated surfaces may be exposed,) I apply the varnished  
" side of both substances to each other, and by means of a cal-  
" lender or rollers, or other suitable means, I powerfully press  
" the fabrics or substances together, whereby they become united  
" and are rendered a compound fabric or substance; and there-  
" after I expose this compound fabric or substance in a store-  
" room, or other suitable place, to a heat of from one hundred  
" to one hundred and forty degrees, for the double purpose  
" of maturing and obtaining a further evaporation of the oil,  
" which while it remains gives off a disagreeable effluvia.  
" When the substances to be united are of an open texture,  
" or not of a smooth and uniform surface, I apply a greater  
" number of coatings of the cement or varnish. And when three

“ or more fabrics or substances are to be united together, I coat  
 “ with the varnish the substance or substances to be inclosed on  
 “ both sides, and complete the process as before suggested.  
 “ Farther, in some cases it may be sufficient to apply the layer  
 “ or coating or coatings of the varnish upon one side only of one  
 “ of the fabrics or substances, applying the other fabric or sub-  
 “ stance uncoated upon the clammy viscous surface of that which  
 “ has received one or more coatings of the varnish, and then  
 “ complete the process as before suggested.”

[Printed, 4d. See Repertory of Arts, vol. 46 (*second series*), p. 199; also, vol. 6 (*new series*), pp. 317 and 365; London Journal (*Newton's*), vol. 8, p. 306; Mechanics' Magazine, vol. 9, p. 108; vol. 2, p. 291; and vol. 24, pp. 400, 409, 439, 506, and 529; Register of Arts and Sciences, vol. 2, p. 131; Engineers' and Mechanics' Encyclopædia, vol. 1, p. 315; Webster's Reports, vol. 1, p. 739; Webster's Patent Law, p. 9; also p. 137, case 161; Carpmael's Reports on Patent Cases, vol. 2, pp. 186 and 188; and Hindmarch on Patents, p. 563.]

A.D. 1824, February 28.—N° 4915.

FLEETWOOD, CHARLES BAGENALL.—“ A liquid and compo-  
 “ sition for making leather and other articles waterproof.” The  
 “ patentee proposes to substitute for “dubbing, oil, or other fat  
 “ animal matters” used for “softening and preserving leather,”  
 the composition as follows:—“I dissolve 10 lbs. of caoutchouc  
 “ or india rubber in twenty gallons of pure spirits of turpentine,”  
 by means of a hot-water bath. “I then dissolve 150 lbs. weight  
 “ of pure bees'-wax in 100 gallons of pure spirits of turpentine,  
 “ adding thereto 20 lbs. of Burgundy pitch, and 10 lbs. of gum  
 “ frankincense.” “To these two matters or solutions when mixed  
 “ together, I add after they are quite cold, 10 gallons of the best  
 “ copal varnish. The whole of these materials are then to be  
 “ put together in a large reservoir, where the compound may be  
 “ diluted by adding 100 gallons of limewater, pouring in 5 gal-  
 “ lons at a time, and stirring it continually for 6 or 8 hours.”  
 If desired to be coloured black then add lampblack mixed with  
 turpentine previous to the addition of the limewater. “The  
 “ composition when thus prepared is to be laid upon the leather  
 “ by means of a painting brush, and rubbed into the surface.”

[Printed, 3d. See Repertory of Arts, vol. 4 (*third series*), p. 129; London Journal (*Newton's*), vol. 8, p. 183; and Register of Arts and Sciences, vol. 2, p. 67.]

A.D. 1824, October 14.—N° 5018.

WEISE, WILLIAM PHILIP.—“Improvements in the preparing  
 “ of and making waterproof cloth and other materials for the

## 20 INDIA RUBBER AND GUTTA PERCHA:

“ manufacturing hats, bonnets, and caps, and wearing apparel, “ and in manufacturing the same therefrom.” The patentee gives, in his Specification, first, a description of the wools and other materials used for making cloth to be applied in hat making and the mode of admixing them. These materials mixed as there described are to be “ carded, and thence through the drawing frame, and afterwards through the roving frame, then on “ bobbins and the stretching frame, making a twisted or thrown “ thread,” “ and reeled into skeins for shoot.” The threads so made should be of two sizes. The finer thread of the two is only to be waterproofed as follows :—“ Mix and unite together equal parts “ of shellac, caoutchouc or india rubber, gum mastic, gum anime, “ and gum sandaric; the caoutchouc to be cut into very small “ pieces, and the shellac and gums to be ground very fine, and “ the whole dissolved in spirits of wine or turpentine, or any “ other spirit, to the consistence of water, and in this waterproof “ size or mixture lay the finer skeins till they are perfectly “ saturated.” When drained and dried, the skeins so prepared may be dyed the colour wanted. The fabric for the hat is then to be manufactured by the weaving of these two threads with a warp dressed with the waterproof size above described. “ The “ fine or waterproof skein to be used for the back or lost shoot, “ and the coarse one for the face of the cloth. When these “ materials are thus woven into cloth, pass the cloth through a hot “ cylinder, or iron it on the back with hot irons, by which the “ mixture on the fine shoot and the warp will run through the “ whole centre of the cloth, uniting the shoots and back of the warp “ together, and thus completing the waterproof process.” The fabric so made is to be carded or teased on its surface, to bring up the nap, and may then be applied to form the outer covering of the hat. Cloth for wearing apparel, such as velvets or broad cloths, may be manufactured and prepared after a similar manner.

[Printed, 3d. See Repertory of Arts, vol. 1 (*third series*), p. 468; and London Journal (*Newton's*), vol. 11, p. 21.]

A.D. 1824, November 29.—5045.

HANCOCK, THOMAS.—“ A method of making or manufacturing an article which may be, in many instances, substituted for “ leather, and be applied to various other useful purposes.” This invention consists “ in combining together the fibres or filaments “ of various matters such as flax, hemp, cotton, wool, hair, or

“ other matters of the like flexible nature, by saturating them  
 “ with a liquid (in some cases mixed with water) which, when  
 “ partially evaporated, becomes a flexible and adhesive substance,”  
 and thereby form a compound substance or article “ somewhat  
 “ resembling leather,” and which may be substituted for leather  
 or other material in the manufacture of “ harness, straps, belts,  
 “ accoutrements, boots, shoes, flexible pipes, air-tight bags, water-  
 “ proof wearing apparel, roofs of virandas, awnings, tent cover-  
 “ ings, and a variety of other things.” The patentee takes one or  
 more layers of fibres of the same or different kinds properly carded  
 or felted, and, having wetted them with warm water, expresses  
 out the excess of water by mechanical means. The layer or layers  
 are then saturated with the “ liquid ” which forms the flexible and  
 adhesive substance. The liquid may be applied by a spatula or  
 the layers may be immersed in the liquid. The excess of liquid  
 is then expressed by means of a roller or otherwise, and the  
 material is partially dried in a room heated to 80° or 90°, and then  
 submitted again to pressure, which causes the fibres to adhere  
 firmly to each other. The liquid used for the above purpose is  
 said (as stated in the Specification) “ to be the juice obtained  
 “ from certain trees which grow in several parts of South  
 “ America, the East Indies, and other places abroad. The tree  
 “ called the ‘ Hevaea ’ is said to produce this liquid. When  
 “ this liquid becomes inspissated or dried, it forms a substance  
 “ which the patentee believes to be identical with ‘ caoutchouc ’  
 “ or india rubber.” The liquid may be deprived of color when  
 desired, by shaking or washing it in water contained in a suitable  
 vessel. In manufacturing articles which require the greatest  
 strength to be in one direction, such as straps or bands, the  
 fibres should be so combed and laid that the length of the fibre  
 shall be in the direction of the required strength.

[Printed, 4d. See Repertory of Arts, vol. 2 (*third series*), p. 281; London  
 Journal (*Newton's*), vol. 10. p. 22; and Engineers' and Mechanics' Ency-  
 clopædia, vol. 2, p. 76.]

A.D. 1825, March 15.—N° 5120.

HANCOCK, THOMAS.—“ A new or improved manufacture,  
 “ which may, in many instances, be used as a substitute for  
 “ leather and otherwise.” This invention consists in “ filling  
 “ saturating, and combining various fibrous substances, [or hair]  
 “ in their manufactured and unmanufactured state, with a

## 22 INDIA RUBBER AND GUTTA PERCHA:

" solution composed of caoutchouc " dissolved in oil of turpentine, and highly rectified coal-tar oil, to which is added black resin, strong glue size, ochre, powdered pumice, or whiting, in proportions, which may be varied as the nature of the application requires. The patentee's mode of application consists, in suitably coating two or more pieces of fabric with the caoutchouc solution, then interposing a layer or layers of carded cotton or other fibre or hair, and submitting the compound fabric to mechanical pressure, then drying it in a room moderately heated, and again submitting it to pressure. The outer surface of cloth may be removed after the pressure, whereby a surface of carded cotton or other fibre will be obtained.

[Printed, 3d. See Register of Arts and Sciences, vol. 4, p. 292.]

A.D. 1825, March 15.—N° 5121.

HANCOCK, THOMAS.—"Improvement or improvements in the  
" making or rendering ships' bottoms, vessels, and utensils of  
" different descriptions and various manufactures, and porous or  
" fibrous substances, impervious to air and water, and for coating  
" and protecting the surfaces of different metallic and other  
" bodies."

No Specification of this Patent was enrolled, but Mr. Hancock forwarded the following description of the invention to the Great Seal Patent Office, on the 4th of January, 1859 :—

"The Specification was intended to embrace the compounding  
" the liquid or original juice of caoutchouc, as mentioned in my  
" Patent of the 29th November, 1824, with vegetable or Stock-  
" holm tar, and some other vegetable matters, but Stockholm  
" tar principally, with the view of rendering the tar entirely or  
" less missible in water. This compound was to be used in  
" cementing fibrous substances into sheets for the purposes men-  
" tioned in the title, and to render the other matters and things  
" therein comprised more or less impermeable to air or water."

A.D. 1825, March 15.—N° 5122.

HANCOCK, THOMAS.—"Improvements in the preparation or  
" in the process of making or manufacturing of ropes or  
" cordage and other articles from hemp, flax, and other fibrous  
" substances." These improvements consist in mixing or  
covering fibrous substances, such as hemp flax, cotton, wool, &c.

when they are formed, or in the process of being formed, into yarns, strands, ropes, cordage, or threads, with a "liquid" which is brought from South America, the East Indies, and other parts, and is stated to be the juice of a tree called the "Hevaca." The patentee believes that this "liquid," when inspicated or dried, is identical with the substance known under the name of caoutchouc or indian rubber. The process employed in applying the "liquid" to the strands or threads is similar to that employed when tar is used to tar ropes.

[Printed, 3d. See Repertory of Arts, vol. 2 (*third series*), p. 359; London Journal (*Newton's*), vol. 11, p. 313; and Register of Arts and Sciences, vol. 3, p. 68.]

A.D. 1825, December 3.—N° 5304.

**BERRY, HENRY.**—"An improved method, in different shapes or forms of securing volatile or other fluids, and concrete or other substances, in various descriptions of bottles and vessels." These improvements consist, first, "in employing the elastic, gummy material called caoutchouc (india rubber) in several ways, adapted to the stoppers of such bottles or other vessels, by which I am enabled to effect an elastic resistance against the mouth of the bottle or other vessel, and at the same time to form a perfectly air-tight junction between the mouth of the bottle or other vessel, and the stopper to which the said caoutchouc is adapted. The shapes or forms in which I employ the elastic material may be arranged in three denominations (*viz.*) caps, collars, and plugs." The first mode of application described consists in placing a disc of india rubber within the usual cap, which, when screwed on to the neck of the bottle, or fastened down by a spring catch, compresses the india rubber on the mouth of the bottle, so as to render it air tight. The second mode described consists in placing a collar of india rubber on the plug of the stopper, and depressing the stopper by means of a screw cap, or by a spring catch, till the collar becomes compressed, and the stopper thereby rendered air tight. The drawings show the applications of this invention to ink and other bottles.

Secondly, consists in forming "elastic plugs or stoppers for bottles and other vessels, by covering ordinary corks with a thin coat of caoutchouc, or by cutting solid caoutchouc into cylindrical pieces." A thin sheet of caoutchouc may be drawn



24 INDIA RUBBER AND GUTTA PERCHA :

over the bottom and sides of the cork and confined at the top by a metal cap, and a wire and screw introduced to make the whole fast ; or the caoutchouc itself may be cut into a cylindrical form, having two caps or end pieces, attached by means of a wire passed through the middle, with a thread upon the wire screwing into the lower cap. On screwing the caps closer together the stopper is enlarged in its diameter by means of the end pressure.

[Printed, 6d. See Repertory of Arts, vol. 3 (*third series*), p. 301 ; London Journal (*Newton's*), vol. 12, p. 119 ; Register of Arts and Sciences, vol. 1 (*new series*), p. 100 ; and Engineer's and Mechanics' Encyclopædia, vol. 1, p. 237.]

A.D. 1826, November 18.—N° 5423.

LACY, HENRY CHARLES.—“ A new apparatus on which to “ suspend carriage bodies.” This invention consists in substituting “ elastic beds or bearings ” for the “ springs ” commonly used for suspending carriages. Such elastic beds are “ secured, “ confined, and kept in a proper position for acting with effect by “ being inclosed in cylinders or cases.” The Specification describes, chiefly, the patentee's mode of making and inserting steel springs of various forms into these boxes. These boxes have a slot in two sides, through which is passed a shackle bar that bears on and compresses the inclosed springs, and from which is suspended the carriage. Instead of metallic springs being inserted into these boxes, “ cubical blocks of caoutchouc “ or india rubber ” may be used. These blocks of india rubber are placed on partition plates within the boxes, and kept asunder by projections on the plates, thereby giving the caoutchouc room to expand laterally when pressed upon by the weight of the body of the carriage. The pillar plate, socket, chase mortices, and shackle bar may be similar to those used when metallic springs fill the box.

[Printed, 1s. 1d. See London Journal (*Newton's*), vol. 13, p. 316 ; Mechanics' Magazine, vol. 13, p. 273.]

A.D. 1826, December 22.—N° 5442.

MORRISON, THOMAS.—“ Method or process of rendering boots, “ shoes, and other articles waterproof.”

[No Specification enrolled.]

A.D. 1827, February 20.—N° 5465.

NICHOLSON, WILLIAM, and COLES, CHARLES BARNWELL.—“ A new method of constructing gasometers or machines,

“ or apparatus for holding and distributing gas, for the purpose of illumination;” and these are, first, “constructing a recipient for gas of materials of an elastic nature, so constructed that the elastic parts shall, by their turning inside outwards, expel almost entirely the gas.” Second, constructing “gasholders which expel their contents by means of a diaphragm passing along their overture in a manner similar to a piston, which diaphragms are rendered gas-tight round their edges by means” of “a continuous tube of leather, stuffed with wool, and pressed into the joint by means of springs.” Third, constructing moveable recipients for gas.

See “Abridgements of Gas, &c.”

The elastic materials are cloth, leather, &c. “rendered impervious to gas by any of the well-known varnishes, or a solution of caoutchouc, vulgarly called india rubber.”

[Printed, 2s. See Repertory of Arts, vol. 6 (*third series*), p. 144; London Journal (*Newton's*), vol. 3 (*second series*), p. 152; Register of Arts and Sciences, vol. 1 (*new series*), p. 81; Engineers and Mechanics' Encyclopedia, vol. 1, p. 60.]

A.D. 1828, January 15.—N° 5604.

**BLADES, JOSEPH** (*a communication*).—“An improvement in the waterproof stiffening for hats.” The patentee claims “the process of waterproof stiffening for hats by dissolving the gum shell lac in alkali instead of spirits [or essential oils which have before been used], and setting or hardening the said gum after it has been introduced into the body of the hat by neutralizing it in weak or diluted acid.” “Salts of tartar” are preferred for the purpose of dissolving the shell lac, and “vitriolic acid as the acid to neutralize the alkali. The hat body is dipped into the clear solution of the lac, or the solution may be applied by brush, sponge, or other means. When so stiffened it is drawn out, and allowed to stand till dry, or nearly so, and then immersed in diluted acid. The strength of the acid should be equal to “half a pint vitriol” to “five gallons of water;” and the shell lac solution may be composed of “18 lbs. shell lac, 1½ lbs. of salts of tartar, and 5½ gallons of water,” boiled together till dissolved.

[Printed, 3d. See Repertory of Arts, vol. 7 (*third series*), p. 142; London Journal (*Newton's*), vol. 2 (*second series*), p. 95; and Mechanics' Magazine, vol. 10, p. 238.]

A.D. 1828, January 15.—N° 5606.

**HARRIS, GEORGE DANIEL**.—“Improvements in dressing and preparing woollen yarn, and in cleansing, dressing, and finish-

“ ing woollen cloths and other fabrics, and in the apparatus “ for performing the same.” These improvements consist,— first, in the alternate application of a “vacuum” and “pressure” to the liquids used, such as soap, alkalies, and acids, enclosed in air-tight vessels, employed in the processes of cleansing and preparing woollen yarns, woollen cloths, and other fabrics. (See “Abridgments on Bleaching, Printing, and Dyeing.”) Secondly, in attaching “to the ordinary gig mill and other “ rotatory machinery employed for cleansing, raising, and dressing a number of ribs of sponge, for the purpose of uniformly “ spreading the water on the face of the cloth, and creating a “ more equal friction against its surface as the gig barrel revolves.” Thirdly, in attaching to the gig barrel fillets of a material “ made from caoutchouc. This caoutchouc having been dissolved by Hancock’s patent process is, in its fluid state, “ impregnated with fine grits, such as emery powder, steel “ filings, pounded glass, or other hard granulated substances ; “ which material, being dried, is then cut into fillets, and “ attached to the gig barrel. The points of the grit protruding “ through the surface of the india rubber form an elastic file, “ which, rubbing against the cloth under operation as the gig “ barrel goes round, straightens the pile or nap, and gives a “ small face to the cloth.” These fillets may be used “in conjunction with teasles, wires, or brushes, or alone ;” and may be adapted to “hand-dressing,” and without the grit the caoutchouc may be employed as an elastic bed for the teasles to bear upon.

[Printed, 7d. See London Journal (*Newton's*), vol. 6 (*second series*), p. 258 ; and Rolls Chapel Reports, 7th Report, p. 127.]

A.D. 1828, June 4.—N<sup>o</sup> 5662.

WEITERSTEDT, Baron CHARLES.—“A liquid or composition “ for waterproofing and strengthening leather.” “Take of rosin “ sixteen pounds, and of tallow five pounds, which being boiled “ together, add one gallon of boiled linseed oil, which being well “ mixed together add one pound and a half of turpentine, in “ which is dissolved one ounce and a half of india rubber. This “ mixture is to be rubbed into the sole or leather intended for “ the under part of the shoes. The following mixture is suitable “ for harness and the upper parts of shoes, as blacking may be “ rubbed on after the composition :—Take of neat’s-foot oil one “ gallon, of tallow six pounds, of hog’s lard one pound, of bees’-

“ wax half a pound, which are to be boiled till the whole is well  
 “ mixed and dissolved; to which, when nearly cold, add of  
 “ spirits of turpentine three pounds, in which is dissolved three  
 “ ounces of india rubber. These being well mixed, and cold,  
 “ will be ready to be applied to the leather either by a brush or  
 “ other means.”

[Printed, 3d. See Repertory of Arts, vol. 9 (*third series*), p. 224; and London Journal (*Newton's*), vol. 3 (*second series*), p. 263.]

A.D. 1829, March 10.—N<sup>o</sup> 5775.

HALL, RICHARD.—“ A composition applicable to certain fabrics  
 “ or substances from which may be manufactured boots, shoes,  
 “ and various other articles.” “ I take one pound of bees'-wax  
 “ [or spermacetti, naptha, petroleum, or turpentine,] eight ounces  
 “ of india rubber or gum; four ounces of rosin [or frankincence,  
 “ asphaltum, or bitumen]; eight ounces of ivory black and four  
 “ ounces of lampblack, and dissolve together, either by boiling or  
 “ by gradual heat; or any of the above-named ingredients may  
 “ be used in greater or less proportions than those I have stated.  
 “ I lay my cloth or other fabric or substance smoothly on a plate  
 “ [which may be heated by steam in preference], and by means  
 “ of a brush or sponge or other suitable method, apply my com-  
 “ position to it, rubbing it well in so that it may be completely  
 “ saturated. I then expose the cloth or other substance for a  
 “ few days to the air, after which it is laid on a smooth surface  
 “ and well rubbed or sleeked with a smooth piece of wood, glass,  
 “ bone, or other smooth substance to give it a smooth and fine  
 “ face, or have it calendered, which has the same effect; after  
 “ which I occasionally apply solution of india rubber or other  
 “ suitable substance on the back of the cloth or fabric or other  
 “ substance, for the purpose of rendering it impervious to  
 “ wet.”

[Printed, 3d. See Repertory of Arts, vol. 8 (*third series*), p. 672; London Journal (*Newton's*), vol. 4 (*second series*), p. 288; and Register of Arts and Sciences, vol. 4 (*new series*), p. 65.

A.D. 1829, September 15.—N<sup>o</sup> 5846.

HARRIS, GEORGE.—“ Improvements in the manufacture of  
 “ ropes and cordage, canvas, and other fabrics and articles, from  
 “ substances hitherto unused for that purpose.” These improve-  
 ments consist, first, “ in preparing certain fibrous substances

## 28 INDIA RUBBER AND GUTTA PERCHA:

" hitherto unused for cordage, canvas, or the like fabrics in this country;" secondly, of a "compound or mixture," and in its application to the fibres of the "silk grass," "of grass, bark, silk, woollen, cotton, flax, hemp, or other the like vegetable or animal substances," by means whereof the same are "rendered more durable and less liable to be injured by the effects of damp or mildew." The compound or mixture referred to is composed of "the juices of certain trees, plants, or vines, such as the ficus Indica, which grows on the coast of Africa and in the East and West Indies, obtained by tapping or making incisions in the said trees, plants, or vines at that season of the year (say the wet season) when they are best adapted for that purpose, and from which incisions a milk or juice flows or exudes." The milk or juice so obtained, being boiled, is mixed with one twenty-fifth of cocoa-nut, palm, or other oils (not being essential oils). This mixture, being again heated, has added to it one twentieth of its weight of "bitumen or asphalte." The mixture so prepared may be applied to the above-named fibres during the process of spinning, as well as when the yarns are being reeled or being made into ropes. Thirdly, the patentee describes his new mode of making "standing rigging," "lines and twine, canvas, sail cloth or other cloths," with threads saturated with the above-described mixture.

[Printed, 4d. See London Journal (*Newton's*), vol. 6 (*second series*), p. 83; and Register of Arts and Sciences, vol. 4 (*new series*), p. 260.

A.D. 1830, March 20.—N° 5922.

ROTCH, BENJAMIN.—"Improved guards or protections for horses' legs and feet under certain circumstances." The "guards or protections" referred to consist of "shoes," "boots," "knee caps," and "rings," made of caoutchouc or india rubber, to be applied to horses. The patentee's mode of producing the required article is as follows:—"I procure bottles of indian rubber, as usually sold in the trade, taking care to choose the largest that can be procured of an even thickness, and having steeped them in hot water just under the boiling point for about five or ten minutes [and cut the necks and bottoms off, if desired], I stretch them on moulds [made of wood in preference] to the shape I require for the purposes aforesaid, and then let them cool, when they will preserve the shape required." Rings cut out of a caoutchouc bottle may be "applied to the

“ leg above and below the hock to keep on a poultice ; and these “ rings may be applied as bandages to protect wounds in various “ ways.” Such articles so made may, from their elasticity, be drawn over the foot and leg, or they may be strapped or buckled on.

By Disclaimer dated A.D. 1835, November 10th, the patentee disclaims that part of the title to the above invention included by the words “ and feet,” and disclaims that part of his invention relating to the application “ of caoutchouc to the protection of “ horses’ feet,” on the ground of “ practical difficulties ;” as also that part of the Specification referring to the application of caoutchouc elastic rings “ for keeping other bandages over wounds on “ horses’ legs,” the same having been previously applied by surgeons and others to the human frame.

[Printed, 6d. *Repertory of Arts*, vol. 11 (*third series*), p. 205; *London Journal (Newton’s)*, vol. 7 (*second series*), p. 325, and vol. 21 (*conjoined series*), p. 474. For Disclaimer, see *Mechanics’ Magazine*, vol. 15, p. 246; *Register of Arts and Sciences*, vol. 6 (*new series*), p. 39; *Engineers and Mechanics’ Encyclopedia*, vol. 1, p. 710.]

A.D. 1830, August 5th.—N<sup>o</sup> 5970.

HANCOCK, THOMAS.—“ Improvements in the manufacture of “ certain articles of dress or wearing apparel, fancy ornaments, “ and figures, and in the method of rendering certain manufactures and substances in a degree or entirely impervious to air “ and water, and of protecting certain manufactures and substances from being injured by air, water, or moisture.” “ The “ composition or varnish ” advantageously used by the patentee to effect the above objects may be compounded as follows:— Ten pounds of liquid caoutchouc [obtained from South America, the East Indies, and other places], ten ounces of whiting, ten ounces of Oxford ochre, and ten ounces of hair, wool, cotton, or other similar fibrous substances [or the wet pulp of rags]. The whiting and ochre should be “ first mixed with a very small “ quantity of water, and the hair, wool, or cotton, or fibrous substance is generally better cut very short, averaging about one “ eighth of an inch in the staple. The whole should be well “ mixed together. Sheets may be made of this compound by “ spreading some of it on a flat surface ;” and when dry it may be made more compact and firm by pressure. Other hard substances may be added to the liquid caoutchouc, such as “ brick-dust or emery powder.” In cases where “ greater stiffness is

30 INDIA RUBBER AND GUTTA PERCHA:

“ required, a small quantity of glue, size, thin starch, or paste, “ or a thin solution of gum arabic may be added.” The colour of the varnish may be varied by adding a little lampblack, chrome yellow, &c., or other colouring matter. From these sheets of the dried mixture may be made any desired and suitable articles of dress or otherwise, or the mixture while in the soft or liquid state may be cast in moulds to form ornaments, figures, &c. When the sheets or articles manufactured above referred to are required to be made more completely waterproof, they may be coated with liquid caoutchouc, having mixed with it any suitable colouring matter. Articles made of linen, cotton, woollen, silk, leather, wood, or metal, also packing cases, tanks, &c., will be rendered more or less impervious to water and air by being coated with the coloured composition or varnish. Such articles as “gaiters, “ coloshes, boots, shoes, hats, caps, fishing boots, and stockings, “ gloves, hose pipes, bags, cart covers, portmanteaus; also fancy “ ornaments and figures, anatomical subjects, busts, &c. may be “ made advantageously by means of this invention.”

[Printed, 4d. See London Journal (*Newton's*), vol. 7 (*conjoined series*), p. 295.]

A.D. 1831, December 1.—N<sup>o</sup> 6193.

SIEVIER, ROBERT WILLIAM.—“ Improvements in the making “ or manufacturing of cables, ropes, whale fishing and other lines, “ lathe and rigger bands, bags, and purses, part of which said “ improved articles are applicable to other useful purposes.”

These improvements consist “in the application or employ- “ ment of filaments, threads, or strands of caoutchouc or india- “ rubber, to or for the making, manufacturing, or constructing “ of elastic cables, ropes, whale fishing and other lines, lathe and “ rigger bands, bags, and purses, such filaments, threads, or “ strands of caoutchouc or india rubber previously platted over “ or covered with hemp, flax, wool, silk, cotton, catgut, Indian “ grass, strips of leather, or other fit and proper materials.” The patentee proposes to stretch strands of caoutchouc to their utmost tension, and cover them while in that state with hemp, flax, wool, cotton, &c., by means of braiding, platting, or otherwise by the ordinary machines used for that purpose. The strands so covered may be placed together in any desired number, and again covered with hemp, &c., whereby an elastic rope will be formed; several of these ropes may in turn be placed together and covered as

before, forming thereby a stronger rope or cable. Such elastic threads or bands may be knitted or worked into bags, purses, or other articles of that kind.

[Printed, 7d. See London Journal (*Newton's*), vol. 1 (*conjoined series*), p. 196; *Mechanics' Magazine*, vol. 26, p. 282; Register of Arts and Sciences, vol. 7 (*new series*), p. 164; Carpmael's Reports on Patent Cases, vol. 1, pp. 331 and 371; Rolls Chapel Reports, 7th Report, p. 137.]

A.D. 1832, November 14.—N° 6334.

DESGRAND, JAMES VINCENT (*a communication*).—“ A method of weaving elastic fabrics.” This invention consists “ in the weaving of such fabrics in any suitable looms of ordinary construction, with bare or uncovered strings or cords of caoutchouc or india rubber, interwoven if necessary with any of the kinds of spun threads or yarns which are commonly used in weaving, whether composed of silk, cotton, flax, wool, or other fibrous materials.” Such bare strings or cords of caoutchouc should be used in all cases without any covering of silk or other thread around them, and are formed or manufactured in the manner heretofore practised; they may be used in weaving as warp or as weft, or as both; or intermixed with other threads; or fibrous materials may form part of the warp or weft, and may be woven into elastic fabrics of any required description, “ whether the same be dimity or satin, or twilled stuff, elastic pipes or tubular wefts, or other of the fabrics woven usually in looms of known construction.” Fabrics made entirely of caoutchouc threads may be rendered water-tight by applying to them hot water, and then strong pressure. The elasticity of the woven caoutchouc thread may be renewed “ by ironing the said fabric with a heated iron, or passing it around or between heated cylinders.” The patentee uses “ hogs' lard or other like greasy material ” to dress the warps with.

[Printed, 4d. See Repertory of Arts, vol. 5 (*new series*), p. 93; London Journal (*Newton's*), vol. 8 (*conjoined series*), p. 78; Carpmael's Reports on Patent Cases, vol. 2, p. 373; Meeson and Welsby's Reports, vol. 14 p. 146; and Dowling and Lowndes's Reports, vol. 2, p. 863.]

A.D. 1832, December 7.—N° 6342.

DUMESTE, JULIEN FREDERICK MAILLARD.—“ A machine to reduce caoutchouc or india rubber into elastic thread, calibered of different sizes.

[No Specification enrolled.]



A.D. 1833, January 17.—N° 6366.

SIEVIER, ROBERT WILLIAM.—“Improvements in the making “ or manufacturing of elastic goods or fabrics, applicable to “ various useful purposes.”

This invention consists, first, “ in producing elastic bandages, “ garters, or bracings round the stocking, sock, glove, nightcap, “ or other articles of wearing apparel,” by introducing by means of a long needle, hook, pincers, or other suitable apparatus answering the purpose of a shuttle, a thread or threads, cords or strands of india rubber, which may, if desired, be coated with filamentous material between the rows or stitches, or loops of knitted materials called stocking fabric; secondly, in forming an elastic fabric by introducing into the warp threads of india rubber; or the warp may be entirely constituted of strands of india rubber, either covered with filamentous material or not. The weft may be composed wholly of ordinary threads, or partly of india rubber strands. Such fabrics composed partly of wool, may be “ finished ” by pulling and raising the pile, &c., as woollen cloths are usually finished. The machinery employed for this purpose may be of any suitable description.

[Printed, 3d. See Repertory of Arts, vol. 6 (*new series*), pp. 89, 102, 176, and 242; vol. 13 (*new series*), p. 157; and vol. 18 (*new series*), p. 382; London Journal (*Newton's*), vol. 3 (*conjoined series*), p. 65; vol. 8 (*conjoined series*), p. 59; vol. 9 (*conjoined series*), p. 368; vol. 14 (*conjoined series*), p. 336; and vol. 15 (*conjoined series*), p. 123; Mechanics' Magazine, vol. 26, p. 233; Webster's Reports, vol. 1, pp. 497, 501, 512, and 513; Webster's Patent Law, p. 48; (also p. 137, case 130, p. 133, case 131, and p. 140, cases 151 and 157; Carpmael's Reports on Patent Cases, vol. 2, pp. 314 and 371; Hindmarch on Patents, pp. 255 and 326; Scott's Reports, vol. 4, p. 307; Hodge's Reports, vol. 2, p. 281; Bingham's New Cases, vol. 3, p. 570; Rolls Chapel Reports, 7th Report, p. 142.]

A.D. 1834, March 27.—N° 6584.

WALTON, JAMES.—“Improvements in cards for carding wool, “ cotton, silk, and other fibrous substances, and for raising the “ pile of woollen and other cloths.” The patentee claims as his invention “the application and adaptation of caoutchouc or “ india rubber, as the fillet or sheet or medium in which the “ dents or teeth are to be set together in the manufacture of “ cards, and thereby obtaining a superior elasticity and durability “ to cards.” In preference, the patentee uses layers cut from the solid block of caoutchouc as imported, of about one eighth of an inch in thickness. The regularity or distance and uniformity of the dents or teeth of the cards are found to be better preserved

by a piece of linen being cemented on to the back of the caoutchouc.

[Printed, 9d. See Repertory of Arts, vol. 3 (*new series*), p. 233; London Journal (*Newton's*), vol. 17 (*conjoined series*), p. 383; vol. 18 (*conjoined series*), p. 45; vol. 19 (*conjoined series*), p. 378; and vol. 20 (*conjoined series*), p. 470; Mechanics' Magazine, vol. 36, p. 510; Record of Patent Inventions, vol. 1, p. 254; Webster's Reports, vol. 1, pp. 580, 585, 597, 613, and 626; Manning and Granger's Reports, vol. 3, pp. 411 and 773; Queen's Bench Reports, vol. 2, p. 969.]

A.D. 1834, May 22.—N° 6609.

EDMONDS, THOMAS.—“A process or method of manipulation and treatment for the preparation of leather, whereby it becomes less pervious to water, and preserves better its pliability during use, than does leather prepared by the ordinary means.” “For the first operation, dissolve, in three gallons of water, alum, four pounds; gum arabic, gum tragacanth, of each two ounces. Apply this solution at nearly boiling heat, with a sponge or soft cloth to both sides of the leather, in either a tanned or tawed state. Whilst the leather is still soft and damp it must be pressed for a few hours betwixt suitable hard and smooth surfaces;” it should then be repeatedly passed through a “rolling machine,” one of the rollers being heated with steam. “For the second operation, liquify by heat, of hogs’ lard and deer suet, each four pounds, and melt together. Also, by the aid of heat of the cleanest rosin, white bees’-wax, and Burgundy pitch, each one pound and a half, in one pint of pale sperm oil.” Mix them while hot, strain, and add “one pint of spirits of turpentine,” and subsequently “half a pint of spirits of wine.” The dressed surface of the leather should be well covered with this composition by means of a boss or mass of fine cloth, and while still moist should be passed again through the rollers till dry. For black leather add to the above mixture “two ounces nitrate of silver,” “four ounces Prussian blue,” and “four ounces lampblack,” or other suitable pigments for the required colour. The third operation consists in rubbing with a pumice stone the surface of the leather till it becomes clear and polished, with a mixture of “burnt alum,” “chalk,” “pipe clay,” and “steel filings.” Lastly, the face of the leather is to be brushed over with liquid bees’-wax in turpentine, coloured to shade required, and again passed through the rollers or betwixt the pressing plates.

[Printed, 3d. See London Journal (*Newton's*), vol. 6 (*conjoined series*), p. 109.]

34 INDIA RUBBER AND GUTTA PERCHA :

A.D. 1834, September 25.—N° 6680.

MOLLERAT, JEAN BAPTISTE.—“ Certain improvements in the “ manufacture of gas for illumination ;’ and these are “ utilizing “ the vapour of certain volatile liquids which are very rich in “ carbon to render them luminous.” And one of these liquids is said to be “ the oil obtained by the distillation of caoutchouc ;” and the gas rendered luminous by the addition “ of these oils is “ either pure hydrogen, or a mixture of hydrogen, carbonated “ hydrogen, and carbonic oxide.” The gas preferred “ is obtained “ by passing steam over red-hot charcoal,” “ or over red-hot coal.” “ This gas is passed through a vessel with one of the oils.”

[Printed, 3d. See London Journal (*Newton's*), vol. 6 (*conjoined series*), p. 73 ; Rolls Chapel Reports, 7th Report, p. 155.]

A.D. 1835, April 28.—N° 6824.

POTTER, WILLIAM SIMPSON.—“ Improvements in rendering “ fabrics waterproof.” These improvements consist in rendering fabrics of linen, cotton, silk, or other stuffs or fabrics made of paper, “ impervious to water but not to air.” The fabric being suitably stretched, is brushed over on the wrong side with or steeped in a composition, at near the boiling point, prepared from the following ingredients:—“ Half an ounce of isinglass ” dissolved in one pound of boiling soft water ; one ounce of alum dissolved in two pounds of water, and quarter<sup>d</sup> of an ounce of soap dissolved in one pound of soft water. These solutions are to be mixed together and again heated. After the fabric so treated becomes dry, it is to be brushed on the wrong side against the grain, and pressed with a hot or cold press, which will “ ungloss ” it. For light fabrics, the relative proportions given above may be varied. The soap may also be first dissolved in oil of turpentine ; and a certain proportion of glue and Arabian gum may be added to the mixture. Such light fabrics may be steeped in the mixture, wrung out, dried, and again wetted with water, or with water “ lightly soaped or alumed,” and dried.

[Printed, 3d. See Repertory of Arts, vol. 5 (*new series*), p. 25 ; and London Journal (*Newton's*), vol. 9 (*conjoined series*), p. 30.]

A.D. 1835, November 28.—N° 6934.

HELLEWELL, JAMES.—“ A improved process or manufacture “ whereby the texture of cotton and certain other fabrics and

"materials may be rendered impervious to water." The object of this invention is to render any required fabric of "single texture" "or of one thickness only," impervious to water, but leaving the fibres of the fabric sufficiently open to allow the necessary passage of air. To affect this, the fabric is steeped or saturated in solutions or mixtures composed as follows:—Dissolve 120 lbs. of common alum in 200 gallons of water; add to this mixture gradually 80 lbs. of common whiting or sugar of lead in sufficient quantity. When entirely cold the clear liquor may be drawn off, and in this state is ready for use. The fabric, after being soaked in this liquor, is taken out, and quickly passed through another liquor at the temperature of 100 F., composed of 63 lbs. of common yellow soap dissolved in about thirty gallons of water. The fabric is then passed through clean water to remove impurities, dried, and finished as required.

By Disclaimer and Memorandum of Alterations, dated A.D. 1838, December 7th, the patentee disclaims the application of his solutions to all fabrics or substances "except cotton;" also certain superfluous words in the original Specification, whereby the description is rendered more clear; and having ascertained that most of the ingredients used by him had been previously used by others for a similar object, he confines his invention to the "improved process" described.

[Printed, 4d. See London Journal (*Newton's*), vol. 11 (*conjoined series*), p. 36; also, vol. 21 (*conjoined series*), p. 477, for Disclaimer; Webster's Reports, vol. 1, p. 401 (note *t*); and Rolls Chapel Reports, 7th Report, p. 168.]

A.D. 1835, December 7.—N<sup>o</sup> 6946.

SIEVIER, ROBERT WILLIAM.—"An improved waterproof cloth "or fabric, made either elastic or non-elastic, applicable to various "useful purposes, and for an improved manufacture of water-proof hats or caps." The patentee produces, first, "a waterproof "cloth or fabric, with a nap or pile fixed on the surface in the "following manner:"—The cloth or fabric is coated on one or both sides with a sufficient quantity of "india rubber" "dissolved "in spirits of turpentine or other proper solvent;" it is then coated a second time with the same solution to which has been added "a portion of acetate of lead, litharge, sulphate of zinc, "gum mastic, or any other proper drying material;" upon this surface is laid or spread proper "fibrous matter," such as wool, cotton, silk, hair, or fur cut into proper lengths, and coloured or

otherwise, and the whole submitted to suitable pressure, or to the action of brushes so as to fix the nap or pile firmly to the surface of the intended cloth or fabric. When dried the surface may be brushed to remove superfluous particles, and, when desired, may be submitted to a shearing process. Fabrics so manufactured will be especially applicable for outward garments, hammer cloths, coverings for seats of open carriages, hangings, druggets, &c.

Secondly, the patentee "prepares a cloth the surface of which shall present a pattern in different colours." In order to affect this purpose, the ordinary printing block, having a woollen surface, is moistened with water and pressed upon a quantity of flock of the desired colour, a sufficient quantity of which adheres to the surface. The block so furnished is then imprinted on the surface of a fabric coated with the india rubber solutions prepared as above. The superior glutinous quality of the india rubber transfers the flock from the block to the fabric. The ground of the fabric may then be flocked as first described, and the whole pressed, brushed, and finished as before. Or, instead of using printing blocks, the pattern may be cut out in thin plates of metal or other suitable material, and the flock material be applied to the surface of the prepared fabric through the holes or interstices of the plates; or instead of using flock to form the pile surface, slivers of wool, cotton, hair, fur, or of other proper material may be employed after the same manner; the pile being obtained afterwards by the gig, tease, or brush. The nap or pile on hats or caps may be produced by similar means, but in this case the patentee prefers to coat the shape or form with an india rubber solution containing a large proportion of acetate of lead, litharge, sulphate of zinc, gum mastic, or other proper drying material, which will produce a harder and more adhering surface.

This invention relates further to the production of an elastic waterproof cloth, in the following manner:—A sheet of india rubber, of about the thickness of one eighth of an inch, being stretched in its length and breadth, is coated with a solution of india rubber; a piece of gauze, strong bobbin-net lace, or other similar open fabric is then pressed and embedded in the surface, and the whole allowed to become dry. This surface is again coated with the india rubber and acetate of lead, &c. mixture first described, then flocked and finished as above. The elasticity of the india rubber which was suspended by the stretching may be renewed by the application of  $180^{\circ}$  of heat. Thin leather or

any fabric may be applied to the stretched sheet of india rubber, on one or both sides, and caused to adhere to it by means of the solution of india rubber; and when the elasticity of the india rubber is renewed as above, it will partially collapse and cause the leather to have a corrugated surface similar to morocco leather, and be both elastic and waterproof, and applicable for boots, shoes, and many other useful purposes.

[Printed, 4d. See London Journal (*Newton's*), vol. 12 (*conjoined series*), p. 219; and Rolls Chapel Reports, 7th Report, p. 168.]

A.D. 1836, February 16.—N° 7004.

WESTHEAD, JOSHUA PROCTOR.—“An improved method of cutting caoutchouc or india rubber, leather, hides, and similar substances, so as to render them applicable to various useful purposes.” The patentee claims as his invention “a machine, or any modification of machine, by which my improved method of cutting caoutchouc or india rubber, hides, and similar substances into a band, tape, or fillet, by means of a revolving or other cutter acting on the exterior edge of such materials, and regularly cutting the same in a spiral or helical direction towards the centre, can or may be effected.” The mode adopted in preference, and described by the patentee, and shewn in the Drawings, consists in causing the mass of caoutchouc or other substance to advance against the edge of a revolving knife with a slow combined forward and circular motion. The knife is caused to revolve at a high speed, and meeting the caoutchouc cuts it into the required ribbon. The caoutchouc advances towards the knife, and rotates till the mass is entirely cut away into a long ribbon, down to its centre. Various modes may be adopted to cause the caoutchouc to advance to the knife; and a longitudinal knife, to which a rapid reciprocating motion may be given, may be employed instead of the revolving knife.

[Printed, 9d. See Repertory of Arts, vol. 6 (*new series*), p. 203; also, vol. 12 (*new series*), p. 107; London Journal (*Newton's*), vol. 13 (*conjoined series*), p. 280; Webster's Patent Law, pp. 28 and 107 (also p. 139, cases 140 and 145); Carmichael's Reports on Patent Cases, vol. 2, pp. 425 and 434; Law Journal (Chancery), p. 89; and Beavan's Reports, vol. 1, p. 309.]

A.D. 1836, February 27.—N° 7015.

SIEVIER, ROBERT WILLIAM.—“An improvement in the means of dissolving and preparing caoutchouc or india rubber for various purposes. For this purpose I take caoutchouc or india rubber,

“ cut into small pieces, and put them into any convenient vessel  
 “ that may be closed at the mouth; I then fill the vessel with  
 “ liquor ammonia, so as to entirely cover the india rubber; in a  
 “ few months it will be dissolved, or its particles separated. I  
 “ then put the solution so made into a still or large retort, and by  
 “ the application of heat nearly the whole of the ammonia will be  
 “ distilled over in a gaseous form, and is to be taken up in the  
 “ usual way by cold water; in that state it again becomes liquor  
 “ ammonia. In this operation of distillation I prefer using a water  
 “ bath, as the india rubber by that means cannot be subjected to  
 “ a heat of more than 212° of Fahrenheit; the ammonia assumes  
 “ a gaseous form at 130°. On separating the ammonia by distil-  
 “ lation as above, the india rubber is left held up in the water, and  
 “ in that state may be applied for waterproofing cloths; or in  
 “ making solid masses of any form, by subjecting the solution to  
 “ evaporation, any degree of consistency may be given to this  
 “ solution by increasing or diminishing the quantity of water  
 “ mixed with the previous dissolved india rubber.”

[Printed, 3d. London Journal (*Newton's*), vol. 11 (*conjoined series*), p. 83;  
*Mechanics' Magazine*, vol. 26, pp. 232, 397, and 510 and *Rolls Chapel*  
*Reports*, 7th Report, p. 171.]

A.D. 1836, February 27.—No 7016.

MARTIN, JAMES.—“ An improvement in dissolving and pre-  
 “ paring caoutchouc and india rubber, to render it applicable to  
 “ various useful purposes.” This invention consists in the pro-  
 “ duction of “ an olefiant or etherial essence for the purpose of  
 “ dissolving caoutchouc.” The “ olefiant or etherial essence” may  
 “ be produced by causing steam to pass through a suitable vessel,  
 “ in which is contained “ fifty gallons of water,” “ fifteen or more  
 “ pounds of the concentrated sulphuric acid of commerce,” and  
 “ three hundred gallons of rough or brown volatile oil or spirit,  
 “ whether vegetable, mineral, or animal.” “ The volatile or ethe-  
 “ rial parts of the rough oil or spirit” are distilled over, condensed  
 “ in a worm, and collected in a receiver. The olefiant or etherial  
 “ essence so produced is “ eminently valuable ” for the purpose of  
 “ dissolving caoutchouc, “ permitting it to return to its natural and  
 “ original state in a more perfect manner than hitherto, and with-  
 “ out leaving behind it any trace of the aroma, odour, or smell of  
 “ the menstruum used.”

[Printed, 6d. See London Journal (*Newton's*), vol. 9 (*conjoined series*),  
 p. 331; and *Rolls Chapel Reports*, 7th Report, p. 171.]

A.D. 1836, March 8.—N° 7020.

**HARTLEY, JOHN GALLEY.**—"Improvements in preparing or manufacturing caoutchouc or india rubber for various useful purposes." The first object of this invention "is the preparation or manufacture of threads or strands from that description of caoutchouc or india rubber which is imported into this country in thick sheets or masses, and is commonly called black caoutchouc or india rubber, in contradistinction to that usually called 'bottles,' from which threads or strands may be obtained of any required degree of fineness, and nearly white. For this purpose the patentee uses the ordinary revolving knife, kept wet by revolving in a trough of water; he places the block of caoutchouc on a pin or centre, and having cut a slit into the caoutchouc, passes this slit or slip between the edge of the knife and the periphery of a regulating roller, which can be adjusted farther from or nearer to the edge of the knife, as desired. The slit or slip of caoutchouc is then pulled forward by the operation between the regulating roller and the knife edge, and is thereby cut in a continuous manner into strips of the required thickness. The strips so cut are again cut by a similar apparatus into smaller strips, the breadth of which shall be equal to their thickness. These small strips are then "soaked in the usual liquor," and drawn out between the fingers into threads and reeled, after the manner heretofore practised with threads made from "bottles." The patentee applies his mode of cutting also to the cutting of "bottles." The "bottle" is first cut or divided nearly into two equal parts, leaving just a slip of continuity. This slip is passed between the regulating roller and the knife edge, and drawn forward till the one half of the bottle is entirely cut into a long ribbon. The other half of the bottle is then cut in a similar manner.

[Printed, 1s. 7d.]

A.D. 1836, September 1.—N° 7178.

**PICKERSGILL, JOHN.**—"Improvements in preparing and applying india rubber (caoutchouc) to fabrics."

The object of this invention "is, first, the preparing india rubber by pressing or rolling it into thin sheets, and applying them to the surfaces of fabrics, that the same may be rendered air and water proof, without the aid of solvents, and



“ without the necessity of bringing the india rubber into  
 “ a state of fluidity ; and, secondly, relates to the application  
 “ of lampblack or other colouring matter to the india rubber  
 “ when the same is spread over only one surface of a fabric  
 “ without the aid of solvents, to render it fluid, whereby the  
 “ surface so prepared may be rendered of a dark, or black, or  
 “ other color, and thus producing an even glossy surface, the  
 “ sticking properties of the india rubber being thereby prevented,  
 “ whereby single fabrics so prepared may be used for a variety of  
 “ purposes without covering or lining.” To effect the prepara-  
 tion of the india rubber, the patentee proposes, first, to cut it into  
 small pieces, and then to pass these pieces several times between  
 heated rollers and under rubbing bars, till the whole becomes so  
 “ intimately blended ” that it will readily allow of being rolled into  
 sheets. When the india rubber has to be applied on one surface  
 of the fabric only, the stickiness may be removed by adding a  
 suitable quantity of lampblack while the india rubber is under-  
 going the first operation of rolling and pressing. The india  
 rubber so prepared is placed in a hopper, which is applied to the  
 surface of two rollers, between which it is drawn and pressed out  
 to a thin sheet. The sheet being carried round meets the web of  
 fabric, and is then caused to pass between other rollers, where the  
 two surfaces are cemented together by means of pressure. If it  
 is desired to have the sheet of india rubber between two fabrics,  
 then the second fabric is united to the other surface of the india  
 rubber, by passing them together between other rollers.

[Printed, 2s. 4d. See Repertory of Arts, vol. 7 (*new series*), p. 291.]

A.D. 1836, October 24.—N<sup>o</sup> 7213.

NICKELS, CHRISTOPHER.—“ Improvements in preparing and  
 “ manufacturing caoutchouc, applicable to various useful pur-  
 “ poses.” The patentee claims, “ first, the making of caoutchouc  
 “ thread from caoutchouc ground and pressed as stated and  
 “ described ” in the Specification ; “ secondly, the combining a  
 “ series of circular knives on an axis, with a suitable roller on  
 “ which they may act, and whereby the knives may revolve at a  
 “ greater speed than the roller ; ” “ also the application of a series  
 “ of discs ” for the purpose of “ dividing tapes of caoutchouc  
 “ into thread ; ” “ thirdly, the cutting of thread from a series of  
 “ circular discs of caoutchouc ; fourthly, the preparing thread or  
 “ caoutchouc for weaving purposes by twisting thread of cotton,

" silk, or other suitable fibre spirally around the same," to protect the thread against the friction in the act of weaving; " fifthly, making waterproof fabrics by the aid of caoutchouc," the caoutchouc being applied by the pressure of a pair of rollers directly to the fabrics, without being brought to a state of liquid solution. Sixthly, weaving certain patterns in elastic webs. " Seventhly, the application of dissolved caoutchouc as a cement for binding the leaves of books, and also the application of caoutchouc, whether pure or compounded, to the covers of books."

By " Disclaimer," dated " 18th June, 1838," the patentee disclaims those parts of the preceding invention included under the third, fourth, fifth, sixth, and seventh heads; and by a " Second Disclaimer," dated " 30th April, 1846," the patentee disclaims also the second head of the invention, and at the same time alters and reduces in extent the title of the invention, as follows:— " Improvements in preparing and manufacturing caoutchouc thread, applicable to various useful purposes." The invention so circumscribed consists in converting into threads " cuttings produced in the former modes of making thread from the better classes of caoutchouc, or any cuttings or small pieces of caoutchouc, or from cuttings of caoutchouc, which are at present considered inferior, in consequence of their porous condition, or want of equality or closeness." The patentee does not claim any mode for grinding the caoutchouc, nor for preparing the same. It may be stated generally, that the cuttings or porous caoutchouc are to be heated, and passed repeatedly through pressing rollers, then ground in a mill till the mass becomes equal; the mass is then placed in a mould, of a cylindrical form in preference, and there brought to a proper degree of density by means of pressure. India rubber so compressed may be cut into sheets or ribbons, and again into threads, then drawn out and spun in like manner to what has been heretofore practised in making thread from other caoutchouc.

[Printed, 2s. 10d. See Repertory of Arts, vol. 8 (*new series*), p. 193; and London Journal (*Newton's*), vol. 12 (*conjoined series*), p. 222.]

A.D. 1836, December 7.—N<sup>o</sup> 7247.

HANCOCK, WILLIAM.—"Improvements in bookbinding." This invention consists "in the employment of caoutchouc in

42 INDIA RUBBER AND GUTTA PERCHA:

"bookbinding," in the manner set forth, or in any other mode, "so that the sheets or leaves of books are in some cases bound together without sawing and sewing," whereby the books so bound will open flatter than heretofore; "and in other cases, where books are sewn or stitched in the usual way, the backs thereof are greatly improved in point of solidity and elasticity." The manner of bookbinding consists, first, in applying to the backs of books while in the press, and after the folded sheets have been cut into separate sheets by suitable means, (which will leave a slightly rough edge,) a solution of caoutchouc dissolved in spirits of turpentine, and then a strip or band of caoutchouc, or of caoutchouc cloth, or cloth coated on one side with india rubber, which should be caused to adhere by pressure. Or, instead of cutting away the whole of the edges of the folded sheets, certain broad grooves may be cut across sufficiently deep to go through the folds that may lie one within the other. The whole back may then be coated with india rubber solution, and cross bands of india rubber cloth inserted into the grooves, the ends of which may be attached to the boards or cover of the books in the usual manner. Books made of leaves in a simple duplicate state may be bound, as described, without cutting the paper into single sheets. When the leaves of books are of large dimension, such as plates or maps, a strip of cotton or other suitable material may be attached to the sheets by means of india rubber solution, and should project to the extent of about a quarter of an inch on each side; and then make up and bind the sheets so prepared in the manner described. Books with backs of one-fold paper, sewn and stitched in the usual way, "are greatly improved by applying thereto caoutchouc or solution of caoutchouc."

[Printed, 3d. See Repertory of Arts, vol. 9 (*new series*), p. 162; and London Journal (*Newton's*), vol. 11 (*conjoined series*), p. 10.]

A.D. 1837, April 18.—N<sup>o</sup> 7344.

HANCOCK, THOMAS.—"An improvement or improvements in the process of rendering cloth and other fabrics partially or entirely impervious to air and water, by means of coutchouc or india rubber;" and these improvements consist as follows:—

First, using and applying to fabrics india rubber, softened to the proper consistency by a small quantity of solvent, in the manner described, thereby saving expense.

Second, using a spreading machine, as described, and with a conducting cloth, when the texture of the fabric to be coated is thin and delicate.

The india rubber, cut in small pieces, is cleaned, dried, and passed through rollers two or three times. This forms it into a sheet, and warms it. It is then put into a masticator, which may be described as a hollow cylinder with closed ends, having a grooved shaft passing through it, and filling a considerable part of the cylinder; this shaft revolves, and kneads the india rubber into a compact roll. This roll is cut into proper pieces, and these are warmed in a stove to a given heat, passed through heated rollers, also of a given temperature, to reduce them into sheets; these are moistened by any suitable means, with "coal oil or other solvent of india rubber," and, if it is required coloring matter may be sifted in now or afterwards. They are left in a covered vessel for several hours, and blended together in the masticator. The mass will be "rather more firm than dough or putty." In this state it is put into the spreading machine, underneath which the fabric to be coated is drawn; an arrangement is made for warming the rubber as it is being laid on the cloth; the spreader itself is "a hollow box of metal brought down at the bottom nearly to an edge, not quite sharp, but "rounded," with arrangements to fix it at any particular distance from the bed of the machine over which the fabric passes.

"Two textures are united, by coating each with the india rubber," and passing them with sufficient pressure between iron and wooden rollers with the coated surfaces "in contact."

[Printed, 10d.]

A.D. 1837, October 19.—N<sup>o</sup> 7447.

TENNESON, HENRI QUENTIN (*a communication*).—"An improved construction of the portable vessels used for containing portable gas, and of the apparatus or machinery used for compressing such gas therein, and of apparatus or mechanism for regulating the issue or supply of gas, either from a portable vessel or from a fixed pipe communicating with an ordinary gasometer." The apparatus for "regulating the issue or supply of gas" may consist of a box of copper, iron, or other such material, in which is placed a diaphragm, in preference made of very light india rubber cloth," although any light "flexible metal which can be made gas tight may be used." This divides

#### 44 . INDIA RUBBER AND GUTTA PERCHA:

the box "horizontally into two parts. The upper part communicates with the atmosphere by holes in the lid, and the lower part is the gas chamber, provided with an induction and eduction pipe. The diaphragm is elevated by means of extra pressure of gas entering. Attached to the diaphragm is the end of a lever, the other end of which carries a rod and valve placed perpendicularly to the mouth of the induction pipe. As the diaphragm rises it elevates one end of the lever, depressing the other, the valve of which closes up more or less completely the induction pipe."

[Printed, 1s. 1d. See London Journal (*Newton's*), vol. 13 (*conjoined series*), p. 18.]

A.D. 1837, December 2.—N<sup>o</sup> 7493.

DOWIE, JAMES.—"Certain improvements in the construction of boots and shoes, and other covering for the human feet;" and these consist in "rendering shoes and boots, which are otherwise composed of rigid or non-elastic materials (or nearly so) elastic and yielding, by the introduction of elastic materials" between the heel and the fore part of the sole of the shoe or boot in that part which is immediately under the elastic arch of the foot, and also by the insertion of "elastic pieces a gores or gussets in the sides of the upper leather or quarters of said boots and shoes, near to the ankle in boots, and to the top of the hind quarters in shoes."

The elastic pieces "may be of various forms, and the elastic substance" may be "either caoutchouc (indian rubber), or a combination of indian rubber and leather, or cloth or woven fabric."

[Printed, 10d. See London Journal (*Newton's*), vol. 12 (*conjoined series*), p. 330.]

[A.D. 1838, January 13.—N<sup>o</sup> 7540.

DAVY, EDWARD.—"Certain improvements in saddles and harness for horses, and in seats for carriages;" and these are, first, preventing the "rubbing or friction between the skin or coat of the animal and certain parts of the saddle or harness." Second, rendering certain parts "(such as collars, cruppers, saddle-cloths, false collars, belly bands, and girths) elastic," &c. Third, giving "greater elasticity to the seat of the saddle,

"and consequently ease and comfort to the rider." Fourth, producing "better friction or adhesion of contact between the sole of the boot or shoe of the rider and the foot-rest of the stirrup, in order to prevent the foot slipping thereon in riding." To accomplish these objects "sheet or sliced india rubber or caoutchouc is employed," also "elastic woven fabric or india-rubber web (made or constructed according to the patent of Mr. R. W. Sievier, or otherwise)."

There is nothing said in the Specification about seats for carriages; and by a Disclaimer, enrolled July 13, 1838, it is stated that the improvements "relating to seats for carriages are not new and useful," &c.; and to make the title consistent with the Specification the words "and in seats for carriages" are disclaimed; and the altered title "may read" "Certain improvements in saddles and harness for horses."

[Printed, 8d. See London Journal (*Newton's*), vol. 14 (*conjoined series*), p. 80; also, vol. 21 (*conjoined series*), p. 476 for Disclaimer.]

A.D. 1838, January 23.—N<sup>o</sup> 7549.

HANCOCK, THOMAS.—"Improvements in the method of manufacturing or preparing caoutchouc, either alone or in combination with other substances," and these consist as follows:—The caoutchouc having been prepared as described in N<sup>o</sup> 7344, is spread by the machine there described upon "linen, silk, cotton, or other suitable cloth," which has been previously saturated so as to "fill the texture with common glue, size, gum, paste, or any other similar substance, easily removeable by water," and dried. "If one coating is not sufficient" the coating operation is repeated, "and when the coating is dry" the whole is immersed "in moderately warm water," and kept there "until the gum or size is sufficiently softened to allow the caoutchouc to be separated from the cloth." If "sheets are required of greater thickness than can be conveniently made by successive coatings upon one cloth," the caoutchouc is spread upon two cloths, and the two coated sides are united together before they are quite dry, and the cloth stripped off from one side. A third coating, which has been spread upon prepared cloth as before described, may be added to it, "and continue to add fresh coatings in the same manner until the required thickness is obtained." Instead of filling the cloth with gum, &c., one side

" may be covered with paper pasted on and caoutchouc spread upon it," &c. " If it is desired to attach the sheets permanently to cloth leather, &c.," the material has " a coating or two of the well-known solution of caoutchouc " spread upon it, and when nearly dry the sheets are united thereto by pressure, " and then strip off the cloth by immersion in water, as before described." " Any suitable pattern or graining may be given to the sheets of caoutchouc by raising figures previously on the prepared cloth, either by embossing or otherwise." " Coloring matter may be added to the caoutchouc," as in N° 7344 ; or the sheets may be coloured by laying on with a brush any of the common pigments, such as flake white, vermillion, lampblack, blue verditer, &c. mixed with a very thin solution of caoutchouc, " being a certain amount of caoutchouc in rectified coal oil or turpentine." " The sheets may be printed with the same colors by means of plates, type, block, or stencilling, in the manner commonly practised." " Sheets to be used as tablets for writing or drawing on with crayons, French chalk, &c." are formed " by adding pumice powder, fine emery, or other similar gritty substances," either in the manner described in N° 7344 with reference to coloring matters, " or by coatings of these substances mixed with a thin solution of caoutchouc after the sheets are made as before described." Sheets are formed " from the original native and liquid caoutchouc, as imported from South America, by preparing the cloth with gum or size, as before stated." " A convenient mode of doing this is by attaching two of the gummed cloths together by means of paste or gum, and then immersing the cloth in the liquid caoutchouc, and allowing the superfluous liquid to run off." The cloth is hung up, and when dry again immersed " in the contrary direction," and again dried ; and this is repeated until " the sheet has acquired the desired thickness." The cloth is separated by immersion in water, as before. These sheets may be figured, coloured, &c., as above. Small sheets, or sheets of particular shapes, may be made by pouring the liquid caoutchouc on moulds of plaster of Paris. If considerable thickness is required, a thin coating is poured on first, and allowed to dry ; and this is repeated " until the desired thickness is obtained." " A raised edge of wood," &c. may be employed " to regulate the required thickness of the sheet, and to prevent the caoutchouc from spreading too far." " A coating of native liquid caoutchouc

"improves the sheets formed of manufactured caoutchouc first described." This is applied in a certain manner.

Long uniform slips or threads are manufactured as follows by immersing a cylinder, which has a spiral groove cut into it of the width or depth of the required slip or thread, in liquid caoutchouc, clearing the liquid by a straight piece of wood or metal "from the projecting parts, and when dry" immersing, &c. again, "and continue so to do until the groove is filled," when the cylinder is immersed in moderately warm water; and the thread drawn off, it will be "the length and size of the spiral groove." A plain cylinder may be coated with the liquid uniformly, and of the required thickness, and the cylinder "put into a machine attached to a screw motion, and the slips or threads cut with a circular knife to the required size." "The machine is well known to persons conversant with this manufacture."

[Printed, &c. See Repertory of Arts, vol. 10 (*new series*), p. 168; and Mechanics' Magazine, vol. 28, p. 101.]

A.D. 1838, January 25.—N<sup>o</sup> 7552.

HANCOCK, CHARLES. — "Certain improved means of producing figured substances, sunk and in relief, and of printing therefrom, and also of moulding, stamping, and embossing;" and, first, etching, engraving, &c., in manner described, a block, cylinder, or other piece of metal, and when so etched using, as a substitute for the blanket of the printing press, a sheet of india rubber, of a certain thickness, cut "to the shape and size of the plate," attached to stout canvass or cloth of size enough to "leave a margin round the sheet adequate to the strain." This piece of canvass, &c. "is fixed in the tympan frame." A single sheet of very thin paper is interposed between the material upon which the impressions are to be taken and the india rubber, to prevent its sticking to it. Second, to produce certain parts of a subject in high relief, pieces of metal of the figure, &c. are cut out or cast, and fixed in their place by "solder or cement," &c. Third, obtaining "by a combination of drawing, painting, and engraving in relief," as described, "a figured surface in relief, from which impressions may be taken by a common printing press." Fourth, employing "a thin solution of caoutchouc (or india rubber), mixed with etching ground diluted to a suitable consistence, or any other composition which will resist the



48 INDIA RUBBER AND GUTTA PERCHA:

"action of acids," to cover the surface of a place to be etched as described, "or, with the same or any suitable composition, draw "or paint upon" metallic surfaces what is required to be in relief, dry, and afterwards treat with acids, &c. as described. Fifth, another mode of etching. Sixth, obtaining a very bold relief. Seventh, obtaining by acids, &c., upon metal, results "applicable to the printing of silks, cottons, paper hangings," and which "may be advantageously employed in works of fine art, as the ordinary modes of engraving may be combined with "it on the same surface." Eight, producing "figured surfaces "sunk and in relief upon thin plates of silver, copper," &c. by indenting with a hard point, &c., or "by means of a die, stamp, or "figured roller." Ninth, employing blocks or stamps of flexible substances, such as india rubber or the composition of glue and treacle, for printing upon glass, porcelain, china, earthenware, and other substances. Tenth, obtaining "figured surfaces from lace, "net, gauze, wire gauze, hair cloth," &c., and in doing so the lace, &c. is "stretched over a plane surface or round a cylinder, "preferring a sheet of india rubber." Eleventh, "printing in a "variety of colors," as described; and when a press is employed, an "india-rubber blanket, as before described, or a cylinder "covered with india rubber, is peculiarly applicable."

[Printed, 4d. See Repertory of Arts, vol. 13 (*new series*), p. 140; London Journal (*Newton's*), vol. 14 (*conjoined series*), p. 331; and Mechanics' Magazine, vol. 36, p. 364.]

A.D. 1838, February 20.—N<sup>o</sup> 7570.

DE BREZA, EUGENE RICHARD LADISLAS.—Using "alum, "sulphate of ammonia, boracic acid, animal glue, and starch "combined in the proportions, in the order, and at the temperatures" given, "and applied in the manner directed, for the "purpose of rendering cloth, wood, paper, and other substances "indestructable by fire, and also preserving them from the "ravages of insects."

[Printed, 3d. See London Journal (*Newton's*), vol. 14 (*conjoined series*), p. 169; and Mechanics' Magazine, vol. 32, p. 131.]

A.D. 1838, April 4.—N<sup>o</sup> 7608.

ROBERTSON, WILLIAM ANGUS.—"Certain improvements in "the manufactory of hosiery, shawls, carpets, rugs, blanket, and "other fabrics;" and these consist of employing in the above

" manufacture " a thread or yarn 'composed wholly of the fur of the hare, rabbit, beaver, musk rat, nutria, otter, or racoon," and " a thread or yarn composed partly of such fur and partly of wool;" also " a thread or yarn composed partly of such fur and partly of silk," in certain proportions; " likewise " a thread or yarn composed partly of such fur and partly of cotton " in certain proportions.

Manufacturing shawls, carpets, rugs, blankets, &c. " wholly of fur, or partly of fur and partly of wool, or partly of fur and partly of hemp, or partly of fur and partly of tow, or partly of fur and partly of cotton, or partly of fur and partly of dressed flax," by causing these various mixtures " to intertwist, interlock and mat together," without the application of any adhesive mixture" in the manner described.

Making carpets, rugs, &c., &c., by felting of or with hair of horses, &c., &c. called " cattle hair," and " without any adhesive mixture," as described.

Applying to the manufactory of hosiery, shawls, carpets, &c. " a thread or yarn partly of wool and partly of tow, and partly of wool and partly of flax," and " partly of cotton and partly of tow," also " partly of wool and partly of the tow of New Zealand flax," &c.

Manufacturing " carpets, rugs, blankets, &c. by the formation of a texture or fabric by means of short threads," " joined by a suitable adhesive substance," (" dissolved caoutchouc or other suitable adhesive substance") " to a cloth or canvass back, &c. at one end of the threads while the other end of the threads is exposed, and forms a surface or nap;" also forming " a texture or fabric by means of short strips of cloth joined as above," &c.

[Printed, 1s. 4d. See Repertory of Arts, vol. 11 (*new series*), p. 321.]

A.D. 1838, April 21.—N<sup>o</sup> 7620.

POOLE, MOSES (*a communication*). — " Improvements in " manufacturing of carpets, rugs, and other napped fabrics;" and these improvements are said to be, first, manufacturing carpets, &c., by " cementing lengths of thread yarn or such like combinations of fibres by cementing such lengths intermediate of their lengths, and producing the napped surface by means of the two ends of each such lengths."

Second, manufacturing carpets &c., " by packing threads or yarns in design, or otherwise, into cases or boxes from which

“ successive quantities can be cemented, protrudes, and allow of  
“ successive slices or surfaces being cut therefrom.”

In the first part of the invention, a roller or beam, on which is warped a number of threads of worsted, wool, cotton, silk, or other fibrous materials or mixtures thereof” is fixed, and the ends of the warp threads made fast to a rail. Strips of metal are arranged over and under through the warp until the frame is filled with “strips upright on their edges in straight lines, parallel  
“ to each other,” “one or more coats of dissolved india rubber or  
“ other cement is to be spread over the surface of the warp and dried,” and the frame turned over and the strips of metal removed by successively cutting each strip, &c. It is then, or before cutting, cemented on to canvass, &c. Instead of the foregoing, strips of metal may have threads or yarns wound round them, and placed closely together in a frame and cemented and cut, &c.

In the second part of the invention, quadrangular frames are arranged, having canvass such as is used for worsted work. A pattern is worked by a needle in worsted, wool, &c., “thro’ a  
“ hole or mesh in the canvas at one end, and thro’ a corresponding  
“ hole in the canvas in the other end,” and so on until the canvas is filled up with the pattern. The result is, a quadrangular mass of yarn or thread. This is encompassed in a box open at both ends, and the canvass cut away, and a piston or rammer inserted into the box, which, when required, forces “out portions or  
“ lengths of the yarn, in order that the same may be cut off after  
“ the same has been combined by cementing the same into a  
“ fabric.” Other modes of obtaining systems of yarns or threads are given, but the mode of cementing in all cases is the same; india rubber or other suitable cement is laid on the surface of the fibres, and when dry, or when a canvass or other fabric has also been added, “the piston is to be forced into the box a length  
“ equal to the length of the nap” required, “when that quantity is to be cut off with a sharp knife, or other suitable instrument.”

[Printed, 1s. 1d. See Repertory of Arts, vol. 11 (*new series*), p. 65.

A.D. 1838, May 31.—N<sup>o</sup> 7664.

RAPER, NICHOLAS.—Improvements in rendering fabrics and leather waterproof.

[No Specification enrolled.]

A.D. 1838, July 11.—N° 7731.

**BETHELL, JOHN.**—"Improvements in rendering wood, cork, leather, woven and felted fabrics, ropes, and cordage, stone and plasters or compositions, either more durable, less pervious to water, or less inflammable, as may be required for various useful purposes;" and these consist in impregnating such articles with various mixtures and solutions.

The impregnation is best effected by pneumatic or hydrostatic pressure, and several modes of applying such are given. One mode of impregnating wood is by means of bags made of sheet caoutchouc or air and water-proof cloth, large enough to hold about two gallons, which are made open at one end, into which the but ends of the pieces of wood are placed, and the edges of the bags tied very firm and close to the pieces of wood by means of small lines;" "to the other ends of the bags are fitted small pipes furnished with stopcocks, which proceed either to an elevated cistern containing the liquid with which it is desired to impregnate the wood," "or else to a liquid forcing pump."

The mixtures or solutions to be used are numerous, and are divided into three classes, as follows:—First class "are applicable to render certain of the articles above named more durable;" second class, are "such as will render all the above-named articles more durable, and less pervious to water;" third class, are "such as will render them less inflammable.

The first class are solutions of a certain strength of sulphate of iron, pyroligneous iron liquor, sulphate of copper, chloride or chlorate of copper, yellow chromate of potash, waters of copper mines and of streams in a copper country, refuse lime water from gas works.

The second class are mixtures or preparations of tar, bitumen, volatile oil or spirit, caoutchouc, black rosin, "dead oil" rosin, whale and fish oils, sulphur, vegetable oils, spirits of turpentine, boiled oil, caoutchouc, bees'-wax.

The third class are, solutions of soluble glass, alum, soda or potash, borax, glue, or starch.

[Printed, &c. See Repertory of Arts, vol. 16 (*new series*), p. 356; London Journal (*Newton's*), vol. 20 (*conjoined series*), p. 111; and Mechanics Magazine, vol. 31, p. 309.]

A.D. 1838, August 6.—N° 7763.

SIEVIER, ROBERT WILLIAM.—“Certain improvements in looms for weaving, and in the mode or method of producing figured goods or fabrics;” and these improvements, as respects the loom, are said to be “raising and depressing the batten or slay and shuttles, either separately or together,” and “are applicable solely to such looms as are furnished with two or more shuttle-races in one batten, situated one above another, in which the shuttles act, carrying different weft threads intended to be wove into one warp.” And as respects the fabric to be woven the improvements consists “in raising up in ribs the figure previously woven flat upon the surface of the goods by causing the fabric to be shrunken.” This is done by allowing the pattern or parts of the warp to float or lay over two or more shoots of the weft, the warp having strands of india rubber introduced among its threads.” The fabric “so produced is flat upon its surface, but by the application of heat the india-rubber strands will contract and cause the warp threads to be drawn up or puckered,” exactly the character of a fabric in which the pattern or figure is produced by weaving on tags or wires.”

[Printed, 2s. 3d. See London Journal (*Newton's*) vol. 20 (*conjoined series*), p. 321.]

A.D. 1838, August 30.—N° 7787.

DAVIES, JOSEPH.—“A composition for protecting wood from flame;” and this may consist of “slate, slate dust, stones, sand, clay, and earth; any of these substances may be used separately, or any or all of them may be used together.” Before using, any of these substances which are not in powder are ground in a mill or otherwise, and boiled with a certain proportion of glue or size, or other gelatinous matter, and stirred until the whole is properly amalgamated. The substance is applied to the wood with a trowel or other suitable instrument.”

[Printed, 3d. See London Journal (*Newton's*), vol. 15 (*conjoined series*), p. 134.]

A.D. 1839, January 3.—N° 7922.

RAPER, THOMAS NICHOLAS. — “Improvements in rendering fabrics and leather waterproof.”

[No Specification enrolled.]

A.D. 1839, July 20.—N° 8158.

**RAPER, THOMAS NICHOLAS.**—"Improvements in rendering "fabrics and leather waterproof;" and these are said to be effected "without obstructing air or perspiration, or imparting any "unpleasant odour," and by immersing, as described, in four different fluids or baths:—

First fluid consists of gelatine, water, ammonia, and carbonate of ammonia.

Second fluid, a solution of sulphate of soda or of potash, or of ammonia, or of phosphate of soda.

Third fluid, a solution of acetate of lead.

Fourth, a bath consisting of fuller's earth, camphor, and water.

These substances are in certain proportions in the different fluids, &c., but the proportions given, and also the salts above mentioned, may be varied; though those salts mentioned are believed "to be the best for the purpose;" and the "first and fourth (fluid, &c.) may be dispensed with, and yet produce a beneficial result in waterproofing fabrics and leather."

[Printed, 3d. See Repertory of Arts, vol. 14 (*new series*), p. 51; London Journal (*Newton's*), vol. 15 (*conjoined series*), p. 444; and Inventor's Advocate, vol. 2, p. 133.]

A.D. 1839, August 1.—N° 8171.

**NICKELS, CHRISTOPHER.**—"Improvements in cutting india "rubber," and these are said to be as follows:—

First. "The mode of cutting sheets of india rubber from the "internal towards the external surface." To effect this, a "grand hoop or ring of metal and caoutchouc" is moved by a worm at a very slow speed towards a reciprocating knife, having a constant supply of water at its edges, and "the sheet or veneer "of caoutchouc cut off" is wound up upon a roller. The caoutchouc may be in its native state or prepared, but preference is given to that prepared according to process in N° 7213.

Second. "The mode of dividing flat surfaces of india rubber "by means of rotatory cutters on flat tables." And this is effected by causing "slabs of indian rubber (which have been previously cut or prepared by any of the well-known means to the "right thickness) upon" a bed, to pass through a set of rotatory cutters, and then through another "set of cutters which divides "it into squares."

54 INDIA RUBBER AND GUTTA PERCHA :

Third. "The mode of employing india rubber as a surface on " which other india rubber is cut, by which the knife will be " preserved longer and the cutting performed more advantage- " ously," and this is performed as follows :—The india rubber to be cut is stretched upon an india rubber cylinder fixed upon a screw shaft, which is placed in a square socket in a hollow cylinder, and also in a screw nut. "The water is turned on and the " machine set in motion, when, after the first revolution or more," the end of the ribbon cut is laid over a drawing roller, which gradually draws the ribbon from the cylinder as fast as it is cut, and the india rubber falls into "a water tank below.

[Printed, 1s. 7d. See Inventors' Advocate, vol. 2, page 134.]

A.D. 1839, August 10.—N<sup>o</sup> 8191.

VARICAS, ROBERT.—"Improvements in rendering fabrics and leather waterproof."

[No Specification enrolled.]

A.D. 1839, December 5.—N<sup>o</sup> 8301.

HALL, JOHN HEATON.—"Improvements in preserving and ren- " dering woollen and other fabrics and leather waterproof;" and these consist in passing these materials through certain prepa- rations.

First preparation.—Alum is dissolved in water, and dry white lead of commerce is rubbed well down in the same menstruum ; both are mixed, the precipitate allowed to subside, the super- natant liquid decanted, and the cloth, &c. passed "through it " immediately;" or dry white lead of commerce, alum, acetic acid, and water are mixed up, the precipitate allowed to subside, and the cloth, &c. passed through the supernatant liquid, and directly is preferred.

After passing the cloths, &c. through either of the above pre- parations, they may be submitted to the following operation :— Pass the cloth, &c. through quicklime and water; then dry, or partially dry, the cloth, &c.; then take Irish moss (moss car- rageen), boil it in water and strain it; pass the cloth, &c. through the liquor, and press the cloth, &c. so that there remains "only " just sufficient to fix the waterproofing material in the fabric, &c."

The preserving solution is made by mixing in a certain manner "camphor, arsenic, white soap, salt of tartar, prepared chalk water." Sometimes a certain quantity of this preservative solution is added to "the first and second preparations, whichever is employed, and so waterproof and preserve at the same time."

The exact quantities of these substances employed are given, but others may be taken; "and when preserving fabrics or leather, the camphor may be omitted in the mixture if the smell be objected to."

[Printed, 3d. See Repertory of Arts, vol. 14 (*new series*), p. 239; London Journal (*Newton's*), vol. 18 (*conjoined series*), p. 259; and Inventors' Advocate, vol. 2, p. 372.]

A.D. 1840, February 8.—N° 8382.

HANCOCK, JAMES.—"A method of forming a fabric or fabrics, applicable to various uses, by combining caoutchouc, or certain compounds thereof, with wood, whalebone, or other fibrous materials, vegetable or animal, manufactured or prepared for that purpose, or with metallic substances manufactured or prepared."

The fabric may be thin strips of whalebone, metal, or metal wire, flatted or round, or slips of wood; these are "platted, crossed, or woven together, the strips crossing, and each strip being alternately above and below, in such a manner as to leave an open space between each strip of from one quarter to half an inch." These fabrics, which may be of combined material, are then placed between two pieces of felt saturated with the caoutchouc compound, by passing into a trough containing it, heated between two rollers passing out through press rollers, and over and through others rollers, or a hydraulic press. Scaleboard may be the covering of these fabrics; in this case, the surfaces of two pieces are covered by spreading with the caoutchouc compound, and the fabric placed between them; "the whole is then submitted to pressure." Sometimes these fabrics are woven, platted, or covered with thread, silk, muslin, &c., &c. "first covering their surfaces with the caoutchouc composition," and pressing them. "The application of these fabrics is very numerous and varied."

The caoutchouc compound is made by mixing in a certain manner, and in certain proportions, caoutchouc, coal tar, oil, or



56 INDIA RUBBER AND GUTTA PERCHA:

oil of turpentine, or both, "pitch, and either Archangel or "Stockholm tar."

[Printed, 4d. See London Journal (*Newton's*), vol. 23 (*conjoined series*), p. 170; and Inventors' Advocate, vol. 3, p. 90.]

A.D. 1840, February 22.—N° 8391.

KERR, THOMAS.—"A new or improved mortar or cement for "buildings, also for mouldings, castings, statuary, tiles, pottery, "imitations of soft and hard rocks, and other useful purposes, "and which mortar or cement is applicable as a manure for pro- "moting vegetation and destroying noxious insects," and in carrying out these several objects a number of substances are employed. These are divided into four sets of substances, so much of each or all being directed to be employed according to the nature of the object to be effected.

No. 1 consists of rakings of roads, streets, &c., sweepings of houses, &c., ashes of fires, sand, pounded stones, and such like substances, mineral or vegetable.

No. 2, chalk and such like substances, "of a drying and "retaining nature, ground into a fine powder."

No. 3, "consisting of either tar, or pitch, or oil, or resin," "or some bituminous, fatty, or inflammable substance, such as Archangel tar, coal tar, pitch, whale oil, linseed oil, &c.

No. 4, "bay or common salt."

Ropes, cables, bands, rick cloths, tarpaulings, &c. &c., "and "most other spun, twined, woven, and felted articles, may be "made not only waterproof, but "stronger by steeping in mixtures of No. 3 and No. 2. "Papers, and carding and boarding," will also be rendered waterproof by adding to the vat, or letting flow upon the web, mixtures of No. 3 and No. 2, "before it enters "between the rollers."

[Printed, 5d. See London Journal (*Newton's*), vol. 21 (*conjoined series*) p. 415; and Inventor's Advocate, vol. 3, p. 131.]

A.D. 1840, March 16.—N° 8429.

VARICAS, ROBERT.—"Improvements in rendering fabrics and "leather waterproof."

[No Specification enrolled.]

A.D. 1840, March 23.—N° 8441.

KEENE, CHARLES.—"Improvements in producing surfaces on "leather and fabrics;" and these are said to be, first, "the mode

“ of preparing external surfaces of leather and fabrics made there-  
“ from, with india rubber (more or less dissolved) as a finished  
“ dressing.”

Second, “ the mode of applying water on the surfaces of rollers  
“ when spreading india rubber (more or less) dissolved on to the  
“ surfaces of leather.”

India rubber, cut in small pieces, is saturated with a certain  
amount of “ turpentine, or any of the known solvents for caout-  
“ chouc, allowed to stand for a given time, and passed through  
“ rollers, while lampblack, or other coloring matter, is being added  
“ to it, to give it the required hue.” When it is of the consistency  
“ of stout dough or putty it is ready for use, and may be kept in  
a reservoir of water.

The skins being prepared in the ordinary manner, are passed over  
by a pair of rollers, one of which spreads the india-rubber mate-  
rial, “ being supplied with a damper of water.” When dry they  
are embossed or gilt in the ordinary manner, and finished “ with  
“ some material to give them a gloss, and remove the adhesive  
“ properties,” and for this purpose “ shellac, dissolved in spirits  
“ of wine, with a small quantity of Venice turpentine, or other  
“ materials may be used if required.”

[Printed, 3d. See Repertory of Arts, vol. 14 (*new series*), p. 233; London  
Journal (*Newton's*), vol. 23 (*conjoined series*), p. 357; and *Mechanics'*  
Magazine, vol. 33, page 397.]

A.D. 1840, May 12.—N° 8503.

NEWBERRY, GEORGE JOHN.—“ Certain improvements in ren-  
“ dering silk, cotton, woollen, linen, and other fabrics waterproof;”  
and these are, first, applying substances to textures saturated with  
waterproofing substances, “ so as to prevent one surface thereof from  
“ drying, hardening, or forming a pellicle thereon, while the other  
“ is allowed to do so by the action of the atmosphere, or artificial  
“ heat to which it is exposed, evaporating a portion of aqueous  
“ or volatile parts of the oil or compositions, and then afterwards  
“ clearing away the moist parts of the oils or compositions by the  
“ agency of spirits of turpentine, or other suitable liquid;”  
second, “ producing damask patterns, or designs, on the surface  
“ of such fabrics.”

[Printed, 3d. See Repertory of Arts, vol. 17 (*new series*), p. 229; London  
Journal (*Newton's*), vol. 19 (*conjoined series*), p. 37; *Mechanics'* Maga-  
zine, vol. 33, p. 406; *Inventors Advocate*, vol. 3, p. 340.]

A.D. 1840, June 24.—N° 8554.

LEESE, JOSEPH, junior.—“ Certain improvements in the art of “ printing calico and other surfaces.” In these improvements relating as stated, one is, “ instead of using the blanket, felt, or “ ordinary lappings in cylinder or block-printing machines, or on “ printing tables,” employing a “ fabric composed of one, two, or “ more (several are preferred) folds of common calico or other “ cloth, upon and between which are to be spread thin layers of “ india rubber applied in solution in a similar manner to pre- “ paring those waterproof cloths now commonly called ‘ Macin- “ tosh ;’ ” also substituting any fabric “ coated on one side “ with india rubber for the “ hatting ” or felt commonly used in “ cutting and forming printing blocks and surface rollers, &c. ;” and likewise placing at the bottom of the engraving of a deeply engraven copper cylinder or roller any cloth “ suitable,” “ pre- “ pared with a thin coating of india rubber on one side,” “ the “ object being to produce an even solid print, and also to furnish “ a good supply of color to the piece.”

(See “ Abridgments of Specifications upon Bleaching, Dyeing, “ and Printing.”)

[Printed, 10d. See London Journal (*Newton's*), vol. 20 (*conjoined series*), p. 343; *Mechanics' Magazine*, vol. 34, p. 44; *Inventors' Advocate*, vol. 4, p. 21.]

A.D. 1840, July 9.—N° 8563.

LECONTE, LOUIS.—“ Improvements in constructing fireproof “ buildings ;” and these are, first, “ applying frames of iron, filled “ with concrete.”

Second, “ constructing beams of bent plates of iron.”

Third, “ forming ceilings and plastered surfaces by the appli- “ cation of wirework instead of laths.”

[Printed, 1s. 4d. See *Mechanics' Magazine*, vol. 34, p. 46; *Inventors' Advo- cate*, vol. 4, p. 51; and *Engineers' and Architects' Journal*, vol. 4, p. 56.]

A.D. 1840, September 7.—N° 8617.

FREEMAN, WILLIAM.—“ Improvements in paving or covering “ roads and other ways or surfaces ;” and these are, applying “ india rubber (caoutchouc) combined with sawdust, sand, or “ finely-broken stone, and pressed into blocks or slabs.”

The india rubber is ground in an iron cylinder with strong axis, and teeth projecting ; the substances to be mixed are added, and when amalgamated are put into moulds, and when cool are ready

for use. The blocks, about the size of bricks, in laying for a road, &c., are made "to adhere one to another by using india-rubber cement." Sometimes the india-rubber blocks are laid, and stone or wood placed upon the top of them.

[Printed, 3d. See Repertory of Arts, vol. 18 (*new series*), p. 118; and vol. 3 (*enlarged series*), p. 55; London Journal (*Newton's*), vol. 20 (*conjoined series*), p. 429; Mechanics' Magazine, vol. 34, p. 223; and Inventors' Advocate, vol. 4, p. 164.]

A.D. 1840, October 15.—N° 8662.

HANCOCK, JAMES.—"An improved method of raising water and other fluids." This invention is said to be applying "to raising water and other fluid," first, "an endless band, whereof one portion is non-absorbent, and the other portion is absorbent of the water and other fluids."

Second, "a basis or foundation," described.

Third, "sponge when attached to a basis or foundation."

Fourth, "a fabric of list cloth and tufts of sponge."

Fifth, "cylinders of network filled with sponge, cork, hair, or wool."

Sixth, "hemp, hair, pieces of the skins or hides of animals, when attached to a basis or foundation."

Seventh, "the horsehair and whalebone brush."

Eighth, "network when used as a protection, covering, or security to an absorbing surface."

Hitherto it is stated in elevating water by an endless rope or band, the rope or band has been equally tenacious or absorbent, by which a loss of power was sustained. Now it is proposed to remedy this defect, and to form ropes combining three qualities of materials. First, "the non-absorbent part" called "the basis or foundation of the bands;" second, "the absorbent part or useful elevating portion;" "third, the outer net or covering which is used to secure and protect the absorbent part or useful elevating portion." The basis is made by taking "two similar and equal pieces of strong woven hempen cloth" or other suitable fabric, "then pay over one side of each of the pieces with 'the compound solution of caoutchouc,' described in N° 8382, and afterwards press them together. "Three or more thicknesses of cloth may be united together. The basis or foundation may be a fabric composed also of warp of iron or other metallic wire, either alone or mixed with split cane and threads of animal and vegetable" substances. The elevating material and other

materials are attached to the base or foundation by the caoutchouc solution and by sewing, &c.

[Printed, 4d. See *Inventors' Advocate*, vol. 4, p. 262.]

A.D. 1841, January 19.—N° 8799.

BEDELLS, CALEB, NICKELS, CHRISTOPHER, TURNER, ARCHIBALD.—“Improvements in the manufacture of braids and “plats;” and these are, first, “the mode of constructing braiding machines whereby extra pipes are used to introduce extra threads, such threads not passing from selvage to selvage of the fabrics produced.”

Second, “the mode of causing the pipes of a circular braiding or plating machine to pass out of the circle into extra heads.”

This last arrangement is made in order “to obtain flat braided or platted fabrics double, to receive longitudinal tapes or threads of india rubber or other material, according to whether it is desired to obtain an elastic fabric or non-elastic fabric,” and may shortly stated to be that, two of the heads in a circular braiding machine are different from the other heads, and have each an extra groove.

[Printed, 2s. 7d. See *Mechanics' Magazine*, vol. 35, p. 140; and *Inventors' Advocate*, vol. 5, p. 69.]

A.D. 1841, February 3.—N° 8830.

HANCOCK, WILLIAM, Jun.—“An improved description of “fabric suitable for making friction gloves, horse brushes, and “other articles requiring rough surfaces;” and the invention is said to consist of “the application of horsehair, and of horsehair “in combination with other substances,” suitable for various purposes. For making the fabric horsehair alone, or combined with wool or cotton, manilla fibre, cocoa nut tree fibre, fine split cane or whalebone are woven in a loom resembling a velvet loom and the pole cut. “If the weaving is well done, the “horsehair is fixed sufficiently firm for all the ordinary purposes “to which” the fabric is applied, “but for the purpose of fixing “the horsehair in the fabric” more securely “a weak solution of “gum trayacanth” or “the solution of caoutchouc” is “smeared “over the ground between the ground bar and harness, and the “shoot is saturated with the same. Either of these solutions

“ when dry give great additional firmness to the fixing of the  
“ horsehair or material composing the pile of the fabric.

[Printed, 4d. See London Journal (*Newton's*), vol. 22. (*conjoined series*),  
p. 273; *Mechanics' Magazine*, vol. 35, p. 175; and *Inventors' Advocate*,  
vol. 5, p. 98.]

A.D. 1841, September 8.—N° 9070.

HEBERT, LUKE (*a communication*). — “ Certain improvements  
“ in the apparatus and materials used in the manufacture of gas  
“ for illumination, and in the apparatus for burning the same.”  
One of these improvements consists in the “ construction of  
“ vessels for containing compressed gas, by forming a shell of any  
“ suitable form and suitable metal, and covering the same with  
“ cloth coated with caoutchouc, and applied in strips with a  
“ layer of lead paper interposed between every three layers of  
“ cloth;” and also the construction of flexible pipes for supplying  
the gas by covering “ a compact helical coil of iron wire ” with a  
layer of lead, over which is “ cloth saturated with caoutchouc,  
“ with a layer of lead paper interposed between the layers of cloth  
“ in the same manner as in the construction of the receiver for  
“ the compressed gas.”

See “ Abridgments of Specifications upon Gas, &c.”

[Printed, 2s. 9d.]

A.D. 1841, December 16.—N° 9189.

FANSHAWE, JOHN AMERICUS.—“ An improved manufacture  
“ of waterproof fabric, applicable to the purpose of covering and  
“ packing bodies, buildings, and goods exposed to water and damp;”  
and this consists in manufacturing sheets of fibrous materials with  
caoutchouc by means of mastication and “ not by solution, which  
“ fibrous substances may be mixed with any or all ” of a number  
of substances. These are “ hair, wool, cotton, flax, hemp, cocoa  
“ nut fibre, or other fibrous substances,” “ pitch, rosin, shell  
“ lac, bitumen, or asphalte, and also, if required, sulphur, white  
“ lead, chalk, red lead, ochre, or other opaque colouring matters.”

A masticator is described fully, and to some extent it resembles  
that described in N° 7344, only it is surrounded by a steam chest  
or hot-air chamber. After mastication, the mixed matters are  
taken out and flattened between hollow rollers “ made warm,  
“ say to about 100 Fahrenheit by the introduction of steam, hot  
“ water, or other means.” It may then be covered with hair or  
other matter, and again pressed between rollers, “ a woven fabric

62 INDIA RUBBER AND GUTTA PERCHA.

"of cotton, flax, or hemp" may be attached "to the sheet of caoutchouc, hair, &c."

[Printed, 64d. See Repertory of Arts, vol. 5 (*enlarged series*), p. 55; and London Journal (*Newton's*), vol. 22 (*conjoined series*), p. 110; Patent Journal, vol. 4, p. 205.]

A.D. 1842, March 21.—N° 9301.

HANCOCK, WILLIAM, JUN.—"Certain improvements in combs and brushes;" and these improvements consist in making combs and brushes with flexible backs, and brushes with metal stocks, &c. These backs are treated "with two or three coats of a solution of caoutchouc, or any other strong flexible cement, (but preferring the former,) and when it is in a sticky state" it is covered with leather, felt, &c. Expanding brushes are made by uniting a piece of caoutchouc in such a manner "that the enclosed space or spaces shall be air tight," and by an arrangement air can be introduced through the handle, by which "the brush can be inflated," &c. "To the flexible backs, before drawing the hairs or bristles, a piece of india-rubber waterproof cloth" is attached, "and that by means of a solution of caoutchouc," &c.

[Printed, 6d. See Repertory of Arts, vol. 1 (*enlarged series*), p. 250; London Journal (*Newton's*), vol. 22 (*conjoined series*), p. 22, and vol. 23 (*conjoined series*), p. 382; Mechanics' Magazine, vol. 37, p. 350; and Record of Patent Inventions, vol. 1, p. 156.]

A.D. 1842, May 7.—N° 9340.

WETZLAR, GODFREY.—"Improvements in rendering fabrics waterproof."

[No Specification enrolled.]

A.D. 1842, July 23.—N° 9426.

VARROC, EUGENE DE.—"Apparatus to be applied to chimneys to prevent their taking fire, and for rendering sweeping of chimneys unnecessary;" and this is said to consist of "an apparatus composed of woven wire cloth or perforated plates of metal introduced near to or at the entrance into the chimney." A cylindrical form of apparatus is preferred. The frame is made of metal, covered and suspended as above.

[Printed, 11d. See Repertory of Arts, vol. 1 (*enlarged series*), p. 201; Record of Patent Inventions, vol. 1, p. 489; and Engineers and Architects' Journal, vol. 6, p. 143.]

A.D. 1842, September 8.—N° 9460.

**ROBSON, JOHN WORDSWORTH.**—"Certain improvements in "the machinery and apparatus for raising, forcing, conveying, "and drawing off liquids;" and these are said to be combining and arranging of parts, as described, "for the construction of a "pump for raising and forcing liquids;" and applying "india "rubber, whether in solution or sheets, to diaphragms or pistons "of leather, as described and represented, whereby a more "perfect vacuum can be obtained than by the use of leather "only." In the Specification the invention is said to consist, first, in the construction of a wheel made of iron, and revolving upon an axle with four arms, bolted to the external sides for the purpose of lifting the water, "and discharging the same upon a "horizontal line with the axle or centre of the wheel." The second part of the invention is in a pump for raising fluids from any number of reservoirs into one general suction, and forcing the fluid into a receiver above. The fluid is drawn from the general suction chamber "by means of a diaphragm or cap, made of "leather or any other flexible substance, with layers of india "rubber between."

[Printed, 3d. See London Journal (*Newton's*), vol. 25 (*conjoined series*), p. 168.]

A.D. 1842, November 25.—N° 9524.

**WILD, CHARLES HEARD.**—"An improved mode of constructing floors for fireproof buildings," and this is said to be constructing such floors "with voussoirs, in the form of parallelopipeds, laid "with parallel, horizontal, and parallel vertical joints, so that "the upper extremities of the voussoirs may form the floor, "which floors may be constructed with or without girders, and "with or without tie rods."

[Printed, 9d.]

A.D. 1843, January 31.—N° 9622.

**HANCOCK, CHARLES.**—"An improved means of dyeing or "staining cotton, woollen, silk, and other fabrics, and rendering "them repellent of waters and moisture," by substituting for the solutions of gum and starch, and the paste ordinarily employed in dyeing, four other solutions made as follows :—



## 64 INDIA RUBBER AND GUTTA PERCHA:

First, "oil (preferring linseed)" is boiled with a certain amount of "raw or burnt Turkey umber, lime, or any other earthy base," "until the mixture acquires the consistency of treacle."

Second, combine by boiling linseed oil with a certain amount of caoutchouc and umber.

Third, a solution of caoutchouc in oil of turpentine or other solvent, to which is "sometimes added acetate of alumina, or "other metallic salts or coloring matters."

Fourth, "bees'-wax in oil of turpentine, or any other suitable oleaginous solvent."

These are thinned down when necessary by "turpentine, "adding occasionally, to make them more drying, a metallic "oxide."

The whole of the above compositions are employed "in combination with coloring matters and mordants for purposes of "dyeing or staining," and the second composition may be used "with or without mordants."

The whole of these compositions, or "any modifications "thereof, either alone or in combination with coloring matters," are applied by printing "to the rendering of cotton, woollen, "silk, and other fabrics repellant of water and moisture," and the second composition may be "applied by printing or otherwise."

The first and second compositions may be applied "alone, or "in combination with coloring matters, or any similar composition containing oil as its principal element, to the rendering of "india-rubber fabrics additionally repellant of water and moisture, whether applied by printing or in any other way."

[Printed, 3d.]

A.D. 1843, February 1.—N° 9624.

CLARK, JAMES.—"An improved mode of manufacturing certain descriptions of cloth;" and this is said to consist in "applying india-rubber cement (dissolved india rubber) by pressure "to a continuous fleece of fibre," and the mode of proceeding may be shortly stated: cotton, waste silk or wool, or other fibres, separately or combined, are passed through two or more carding machines, and united between two rollers, and passing on between other sets of rollers, receives a coat or coating at each, as it may be required, after which it passes through drying cylinders, when it is wound on to friction beams.

[Printed, 6d. See Repertory of Arts, vol. 2 (*enlarged series*), p. 290; and London Journal (*Newton's*), vol. 23 (*conjoined series*), p. 263.]

A.D. 1843, May 22.—N° 9735.

NICKELS, CHRISTOPHER. — “Improvements in the manufacture of fabrics made by lace machinery,” and these improvements are, first, “making of fabrics in twist-lace machines by employing threads or yarns of spun fibrous materials, covered with silk or other suitable material, before being worked up into fabrics by such machines;” second, “making of fabrics in warp-lace machines by employing thread or yarn of spun fibrous materials, covered with silk or other suitable material, before being worked up into fabrics by such machines;” third, “manufacturing fabrics in twist-lace machines by introducing strands of india rubber transversely over such fabrics, as they are produced in such machines.”

[Printed, 7d. See Repertory of Arts, vol. 3. (*enlarged series*), p. 22.]

A.D. 1843, June 10.—N° 9763.

AUSTIN, HENRY.—“A new method of glueing or cementing certain materials for building and other purposes,” and this, it is stated, consists, first, in applying “caoutchouc in combination with other materials for the purposes of cementing or glueing together,” as described, “slate, tile, stone, and metal plates for roofing and other building purposes, and glass for such building and other operations;” second, applying “such cement, glue, or composition” “for the purposes of glueing or cementing together such materials” “for such building and other purposes,” as described.

The cement is made by dissolving a certain weight of “caoutchouc in cold naptha,” taking this solution, and mixing it in different proportions, according to the purpose to which the cement is to be applied, with lac, dissolving the same with heat. The cement is always applied hot. “Asphalt pitch, or rosin, or other material of that nature,” may be substituted “for the lac.”

Leather or cork, wood, metal, woven, or other fabrics, and manufactured clays and cements may be glued or cemented by this “cement, glue, or composition.”

[Printed, 4d. See London Journal (*Newton's*), vol. 25 (*conjoined series*) p. 17.]

A.D. 1843, June 27.—N° 9807.

PARKES, ALEXANDER.—“Improvements in preparing solutions of certain vegetable and animal matters applicable to preserving wood and other substances, and for other uses;” and these are said to be obtaining solutions of the vegetable and animal matters (caoutchouc, gum, mastic, other gums or resins, amber, lac, wax, tallow, suet, phosphorous,) by combining therewith eupion and bisulphuret of carbon, or other sulphuret of carbon. Some of these solutions are employed for preserving substances, and others for giving to non-metallic substances the power of depositing metals upon their surface when immersed in a metallic solution.

[Printed, 3*d*. See London Journal (*Newton's*), vol. 24 (*conjoined series*), p. 251; and Repertory of Arts, vol. 6 (*enlarged series*), p. 247.]

A.D. 1843, July 6.—N° 9815.

HARTLEY, JAMES.—“Improvements in the manufacture of glass;” and these are, first, “improvement of a flattening kiln,” by applying a stone capable of rotating horizontally for successively receiving the cylinders of glass to be flattened before they are removed to the flattening stone;” second, “employing a flattening stone perforated with numerous holes;” third, applying “india rubber for holding sheets or plates of glass to be ground or polished;” fourth, “the mode herein described of constructing furnaces, used for heating the ‘nose’ of crown glass just before introducing the glass into a flashing furnace,” and this consists in introducing the air in a certain manner above the fuel in the furnace.

In polishing or grinding glass, sheets of india rubber cut true on the surface may be employed, owing to their “peculiar holding character,” upon which to lay the plates of glass to be ground. “When the weather is cold, and the surface of the india rubber hardened thereby,” the surface should be slightly warmed before a fire, or otherwise.”

[Printed, 4*d*. See Repertory of Arts, vol. 3 (*enlarged series*), p. 285; London Journal (*Newton's*), vol. 25 (*conjoined series*), p. 185; Engineers and Architects' Journal, vol. 7, p. 35.]

A.D. 1843, August 22.—N° 9871.

DRAKE, JOHN COLLARD.—“Improvements in lining walls of houses;” and there are said to be “the mode of lining walls of

“ houses by the application of calico or other fabric coated at the back with india rubber.” Strips of fabric, about three or four inches wide, are coated with a solution of india rubber “ on both sides thereof, the one side is caused to adhere to the wall by the india-rubber cement ;” “ the other surface of these strips is made to adhere to a cotton or other fabric ; the interior surface of which is previously coated with india rubber, the outer surface being “ painted or decorated before putting up, or it may have paper hanging stuck thereto after it is up,” &c.

[Printed, 9d. See London Journal (*Newton's*), vol. 24 (*conjoined series*) p. 361 ; *Mechanics' Magazine*, vol. 40, p. 316 ; and *Engineers and Architects' Journal*, vol. 7, p. 114.]

A.D. 1843, October 5.—N° 9900.

MARSHALL, MARGARET HENRIETTA.—“ A certain improved plastic composition applicable to the fine arts, and to useful and ornamental purposes.” “ The composition is denominated patent intonaco,” and is formed of the following substances, and by mixing them in certain proportions and in a certain manner :—Vegetable gluten, gelatine or albumen, animal gluten, gelatine or albumen, oil, or animal fat, indian rubber, sulphate of lime. “ The following may be named as the principal uses of the intonaco :”—“ First, as a fire and water resisting plaster for walls ; second, imitations of marble and other stones ; third, architectural mouldings and ornaments ; fourth, for covering the unplastered side of front walls, to prevent the radiation of heat, of that side, &c. ; fifth, ornamental garden architecture, &c. ; sixth, for covering wooden shelving in shops and warehouses, as a preservative from fire ; seventh, for imitations of ancient wainscoating, and all other manner of carving in wood ; eighth, as a ground for gilding, &c. ; ninth, as a ground for decorative painting in fresco, tecco-tempora, and encaustic, &c. ; tenth, for making casts and models ; eleventh, for making tessellated pavement and ornamental tiles ; twelfth, as paint for ceilings and walls ; thirteenth, for all domestic uses to which marble is now employed ; fourteenth, for moulds and ornaments ; fifteenth, for making artificial globes ; sixteenth, for all purposes to which putty is applied, and a great variety of other useful and ornamental purposes.”

[Printed, 3d. See London Journal (*Newton's*), vol. 25 (*conjoined series*), p. 88.]

A.D. 1843, October 13.—N° 9908.

BEARD, RICHARD.—“Improvements in printing calicoes and “ other fabrics.” These are “the application of sieve rollers,” as described “in combination with printing cylinders or rollers for “ printing calicoes and other fabrics.” This invention is said to be applicable to such “transmitting or sieve rollers as were described” in the Specification of a Patent, N° 8109, granted to the Patentee 17th June 1839 (see “Abridgments of Specifications of Patents upon Bleaching, Dyeing,” &c.) “The rollers, “ excepting the axes, are composed of a glutinous or gelatinous “ composition in a state of stiff jelly;” the composition preferred is glue and treacle mixed in certain proportions and in a certain manner. The rollers are covered with “sieve cloth or felt.” “In “ order to prevent water or the fluids used in printing passing “ through the felt or sieve cloth so as to injure the composition,” “ there should be a thin coat of india rubber placed at the side “ of the felt or sieve cloth which comes next the elastic composition, the composition being first covered with ‘oil case,’ “ similar to that used by block printers, or other means may be “ resorted to for rendering the sieve cloth fluid-tight.” (See “Abridgments of Specifications upon Bleaching, Dyeing, “ and Printing.”)

[Printed, 6d. See London Journal (*Newton's*), vol. 24 (*conjoined series*), p. 420.]

A.D. 1843, November 9.—N° 9935.

HANCOCK, WALTER. — “Improvements in manufacturing “ caoutchouc, and caoutchouc in combination with other substances, and in machinery or apparatus for preparing caoutchouc and other materials;” and these are said to be,—first “arranging a cutting machine” “for the purpose of reducing “ india rubber into small particles;” second, “manufacturing “ sheets of any required thickness from a combination of the “ solution of caoutchouc or india rubber mixed with ground or “ pulverized cork, by causing fabrics of cotton or other fibrous “ material to be passed with such combination of materials through “ between pressing rollers or guages;” third, “obtaining the “ solvent of india rubber after the dissolved india rubber has “ been spread on to fabrics, by employing an exhausting apparatus

" and condenser, with other suitable apparatus;" fourth, "dissolving, or partially dissolving, india rubber, by using a solvent in the state of vapour."

The cutting machine described, is a pair of rollers, the peripheries of which are toothed, and work nearly up to each other. A steel bar with teeth passes upwards, and the teeth of the rollers work between the teeth of the bar. The india rubber is fed in by a hopper above the rollers, and pressed down upon them by a weight, and after passing through the cutting rollers falls into a cistern or vessel.

The second part of the invention may be described as follows :—A frame is fixed, having a roller at each end set opposite to each other; on each of these rollers is a web of cloth; in the centre of the frame are two other rollers placed as near to each other as the thickness of the fabric required to be made; underneath is a drum to wind off the fabric. Over the two center rollers is a hopper with the material (dissolved caoutchouc mixed with ground or rasped cork or cork dust, &c.) with a weight to press it down on to the rollers, between which the cloth from each of the end rollers passes, and is attached to the winding-off drum underneath. On motion being given to this drum it draws the two cloths from the end rollers through the centre rollers, and combined with the mixture or composition.

To obtain the solvent after the cloth is spread with dissolved caoutchouc, an arrangement is made by which the cloth passes under a cover along a heated plate; in the cover is a pipe leading to an exhauster and condenser. Another mode of doing this, is by an oven, to which is attached an exhauster, condenser, &c.

The apparatus for dissolving the india rubber is a cylindrical iron vessel, capable of bearing pressure, and contains the india rubber; the lid is fixed by bolts, nuts, &c. The vapour of the solvent is passed by a pipe into this vessel from another vessel attached to it, or stopped from it by a cock. The cylindrical vessel has a means of being heated, and a tube by which it may be exhausted before "the admission of the vapourized solvent."

[Printed, 10d. See Repertory of Arts, vol. 4 (*enlarged series*), p. 20]

A.D. 1843, November 21.—N<sup>o</sup> 9952.

HANCOCK, THOMAS.—"An improvement or improvements in the preparation or manufacture of caoutchouc in combina-

“ tion with other substances, which preparation or manufacture  
 “ is suitable for rendering leather, cloth, and other fabrics water-  
 “ proof, and to various other purposes for which caoutchouc is  
 “ employed ;” and these improvements are said to be, first, combin-  
 ing “ caoutchouc with silicate of magnesia, whereby manufactured  
 “ caoutchouc is rendered free from that clammy and adhesive  
 “ character which it usually possesses ;” second, “ the modes of  
 “ combining asphalt with caoutchouc ;” third, treating “ caout-  
 “ chouc (either alone or in combination with other substances)  
 “ with sulphur when acted on by heat, and thus changing the  
 “ character of caoutchouc.”

The improvements, first and second, substituting the substances to be now employed for those then employed, are pretty fully detailed in Specifications of Patents N° 7344 and N° 7549.

The third is, immersing the caoutchouc in melted sulphur or mixing it with sulphur in any way whatever, and submitting it to high temperatures, and thus changing the nature of the rubber completely. The heating is by oven or by water or steam under pressure. The result may be stated to be no longer effected by temperatures or by the usual solvents for ordinary india rubber. Other things may be blended in the caoutchouc with the sulphur and the “ change ” effected by heat. The temperature from 300° to 400° varies with the nature, quality and size of the material to be changed ; at first, the rubber is elastic, but by higher temperatures, or by longer keeping in high temperatures, the caoutchouc gradually changes until it ultimately becomes black, “ and has something the appearance of horn, and may be “ pared with a knife similarly to that substance.”

This process is known by the term “ vulcanizing,” and the article produced is said to be “ vulcanized.”

[Printed, 44d. See Repertory of Arts, vol. 5 (*enlarged series*), p. 154 ; London Journal (*Newton's*), vol. 26 (*conjoined series*), p. 178, and vol. 39 (*conjoined series*), p. 158 ; Exchequer Reports, vol. 9, p. 388 ; Law Journal (Exchequer), vol. 23, p. 110 ; and Patent Journal, vol. 11, page 152.]

A.D. 1844, January 11.—N° 10,006.

WRIGHT, WILLIAM.—“ Certain improvements in rendering  
 “ leather skins or hides impervious to wet, more flexible and  
 “ more durable ;” and these are said to be “ four compositions,  
 “ prepared and compounded ” as described ; also, “ the combina-  
 “ tion and application of those compositions to leather,” &c.

The four compositions are made of the following substances in certain proportions, and they are combined in a certain manner,—linseed oil, rape oil, or neat's foot oil, fat, such as bullocks', sheeps', or deers', bees'-wax, gum of caoutchouc, oil of turpentine, Burgundy pitch, rosin, cod oil, spermaceti whale oil. The leathers are selected according to their thickness, &c., and submerged accordingly in mixtures of these compositions and dried, &c.

[Printed, 4d. See Repertory of Arts, vol. 4 (*enlarged series*), p. 101; London Journal (*Newton's*), vol. 25 (*conjoined series*), p. 118; and Mechanics' Magazine, vol. 41, pp. 189 and 200.]

A.D. 1844, January 30.—N° 10,027.

NEWTON, WILLIAM EDWARD (*a communication* [*Goodyear*]). —“Improvements in the preparation of caoutchouc or india rubber, and in manufacturing various fabrics, of which caoutchouc forms a competent part;” and these are, first, combining india rubber with sulphur and with whitelead, so as to form a triple compound;” the salts or oxides of lead may be substituted for the carbonate; second, forming “a fabric of the india rubber by interposing layers of cotton batting between those of gum;” third “exposing the india-rubber fabric to the action of a high degree of heat,” “by means of which this improved compound is effectually changed in its properties, so as to protect it from decomposition or deterioration by the action of those agents which have heretofore been found to produce that effect upon india-rubber goods;” fourth, “a new manufacture” denominated corrugated or ‘shurred’ goods;” these goods are formed “by the stretching of strips of india rubber to such extent as may be desired,” covering them on each side with laminæ of cloth, leather,” &c., “which laminæ are united to each other and to the strips by means of india-rubber cement,” and smoothing “with a piece of ivory” &c., “along the side of each of the strips;” fifth, parts of a “machine for the manufacture of corrugated or ‘shurred’ india-rubber goods,” that is to say, the combining with calender rollers an elastic endless apron, and a stretching frame with its appurtenances “for the purpose of giving and preserving to the strips or threads their proper tension, and allowing them to pass between the laminæ of coated cloth or other material.”

[Printed, 7d. See Repertory of Arts, vol. 4 (*enlarged series*), p. 271; and London Journal (*Newton's*), vol. 25 (*conjoined series*), p. 252.]



A.D. 1844, February 10.—N° 10,047.

FOX, HENRY HAWES.—“An improved mode of constructing “ fireproof floors, ceilings, and roofs,” and the improved mode is said to consist in as follows :—First, constructing “ a floor by the “ particular combination and arrangement in layers of materials” described “ on laths supported on cast-iron joints,” “ and “ finished by saturating the surface with oil ;” second, attaching “ an ordinary ceiling to the under side of a floor constructed ” as above, “ whereby both the floor and the ceiling are rendered fire- “ proof ;” third, constructing “ a roof in the same manner as ” the floor is constructed, “ so as to make it fireproof ; but, instead “ of the oiled surface given to the floor, covering it with pitch, “ tar, paper, and sand.”

The “ materials ” described are several in number, and are mixtures, in certain proportions, of the following substances, and combined in different ways.

Lime and coal ashes called “ rendering ;” road grit, coal ashes, and lime called “ pugging ;” coarse sand and lime, “ a cement.” “ The surface coating or floating, fine sand and lime, and when “ dry coating twice with hot linseed oil. A ‘ floating ’ of hair “ mortar without any oil.”

[Printed, 10d. See Engineers and Architects’ Journal, vol. 7, p. 321.]

A.D. 1844, February 14.—N° 10,054.

GALLOWAY, ELIJAH.—“ Certain combinations of materials to “ be used as a substitute for canvas and other surfaces employed “ as grounds for painting, some of which combinations are “ applicable to other purposes.” These combinations of materials “ consist of india rubber combined with earthy, woody, or fibrous “ matter, or any insoluble substance which is capable of being “ reduced to small fragments, not coarser than sand or sawdust, “ and occasionally to fine powder.” “ The india rubber is pre- “ pared by a well-known process (fully described in the Speci- “ fications of other Patents) of grinding,” mixing with other matters, rolling into sheets which may be printed upon, &c. &c. Among the matters named are chalk, dried clay, and cork, and when exposed to moisture “ a small quantity of corrosive sub- “ limate or other metallic salt.” The mixture of cork, india

rubber, and corrosive sublimate is to be employed in various ways in ship and boat building, for floorcloths, roofs, walls, &c.

[Printed, 3d. See London Journal (*Newton's*), vol. 25 (*conjoined series*), p. 235; and Engineers and Architects' Journal, vol. 7, p. 423.]

A.D. 1844, February 19.—N° 10,060.

**BEDELLS, CALEB.**—“Improvements in the manufacture of “elastic fabrics;” and these are said to consist in “employing “looped fabrics combined by cementing with india rubber in “such a manner as to obtain the elasticity of the india rubber “conjoined with the yielding or extending and contracting of “such looped fabrics,” and are effected as follows:—Two fabrics “made by stocking or knitting frames” are coated each on one side with india rubber solution, and between these two coated sides are introduced strands or tapes of india rubber in the non-elastic state, that is, strands which have been extended and kept so until it has become set and non-elastic. The whole brought together and pressed, becomes one fabric, and heat applied will return elasticity to the india strands, and so effect the object. There are other modifications of this process, and the india rubber may “be worked into one of the fabrics when making it in the “machine,” and another fabric stuck on to it afterwards by india rubber solution; this, “however, is a more costly mode of “production, and not materially different from the” first.

[Printed, 3d. See Repertory of Arts, vol. 4 (*enlarged series*), p. 306; and London Journal (*Newton's*), vol. 25 (*conjoined series*), p. 175.]

A.D. 1844, February 19.—N° 10,061.

**NICKELS, CHRISTOPHER, and NICKELS, BENJAMIN.**—“Improvements in the manufacture of elastic fabrics, and in rendering elastic fabrics less elastic;” and these are, first, “the mode of making elastic fabrics by introducing strands of india rubber transversely into the description of double knit fabrics” described.

Second, the introduction of strands of non-elastic yarn into the “description of double knit fabrics,” described.

The fabrics are made in framework-knitting frames “which have the loops taken off the needles by what are called ticklers,” &c., “and to make the fabric more elastic, a strand of india rubber “either covered or uncovered in the non-elastic state” is “intro-

duced between the ticklers" "and the loops in the beards of the needles," "and when it is desired to make these descriptions of fabrics less elastic, a strand of non-elastic thread is introduced in place of the india rubber, and, in some cases, india rubber and non-elastic strands are introduced alternately," or how it is desired. In some cases, in place of introducing the india rubber at the time of making the fabric, "wires with eyes at one end or draw threads are introduced," so that the india rubber, &c. may be drawn in in their place "after the fabric has been taken out of the machine."

[Printed, 1s. 1d. See Repertory of Arts, vol. 4 (*enlarged series*), p. 336; and London Journal (*Newton's*) vol. 25 (*conjoined series*), p. 182.]

A.D. 1844, March 6.—N<sup>o</sup> 10,092.

FOSTER, THOMAS.—"Improvements in preparing compositions of india rubber and other matters for forming articles therefrom, and for the coating of surfaces of leather and woven and other fabrics;" and these are, first, "applying or spreading a composition of india rubber and shell lac or other resinous gum or bitumen (not soluble in water) together with a solvent gum, and with or without arseniate of potash or other mineral preserver of vegetable matter" on the above substances; second, "combining such a quantity of shell lac or other gum, with or without arseniate of potash, with india rubber, as to produce a composition which may be moulded into various forms, and retain the desired figure;" third, making "sheets of the composition" "by spreading the same on a previously prepared surface;" fourth, grinding and mixing the materials in a machine composed of two angular rollers placed in a heated vessel."

The materials mentioned are mixed in certain proportions according to what is to be done with the mixture. They are also mixed in a certain manner. When moulded, the mixture is put into the moulds hot, and pressed till it is cold. This composition submitted to the "rays or light of the sun for a few hours loses its sticking character, and will not be injured by any heat which it may be afterwards exposed to, by being in the sun," &c. Cloth, &c. coated with it is submitted to the rays of the sun afterwards.

[Printed, 7d. See Repertory of Arts, vol. 5 (*enlarged series*), p. 288; and London Journal (*Newton's*), vol. 27 (*conjoined series*), p. 188.]

A.D. 1844, March 6.—N° 10,094.

**TOWNEND, CHARLES.**—"An improved process or manufacture whereby cotton fabrics are aided and made repellent to water and mildew, and any unpleasant smell is prevented in such fabrics;" and this process consists, in steeping the fabrics, previously dyed and prepared, in either of the following solutions, composed of the following substances, and mixed in a certain manner, and in certain proportions:—First solution: Water, calcined British gum, palm or white soap, logwood liquor, rock alum. Second solution: Water, sulphate of zinc (white vitriol), calcined British gum, palm or white soap.

[Printed, 3d. See Repertory of Arts, vol. 4 (*enlarged series*), p. 46; London Journal (*Newton's*), vol. 25 (*conjoined series*), p. 40; Mechanics' Magazine vol. 40, p. 415, and vol. 41, p. 127; and Engineers and Architects' Journal, vol. 7. p. 324.]

A.D. 1844, March 19.—N° 10,110.

**BURKE, WILLIAM HENRY.**—"Certain improved machinery for cutting indian rubber, and other elastic substances, into balls and other solid figures;" and two machines are described, one of which cuts out of a block a solid cylindrical piece, with a hole through the centre for attaching it to the second machine.

The first machine is a wooden bench supporting an iron arched frame, through which works, by a screw, a vertical spindle, the point of which is inserted into a block of india rubber, &c., made fast to the wooden bench; near to the bottom of the spindle is an arm affixed to it, to which is attached an adjustable cutting blade, rotary motion being given to the spindle by a winch; the spindle gradually descends, and along with it the cutter, until a solid cylindrical piece is cut out, and with its spindle is introduced into the second machine into a frame; the frame is raised so as to bring the india rubber into contact with a gouge cutter. The crank shaft revolves, and communicates oscillatory movements to a shaft which carries the gouge cutter, causing it to pare the surface of the india rubber, whilst by other arrangements the lump of india rubber is brought "up to the edge of the cutter, and its surface is pared away until the cylinder is reduced in form to the spherical figure."

[Printed, 1s. 3d.]

A.D. 1844, May 15.—N° 10,185.

HANCOCK, CHARLES.—“ *Certain improvements in cork and other stoppers, and a new composition or substance which may be used as a substitute for, and in preference to, cork; and a method or methods of manufacturing the said new composition or substance into bungs, stoppers, and other useful articles;*” and these were said to be, first, the new composition or substance “ *gutta percha,*” “ *in any of the states, and according to any of the methods*” described “ *in the manufacture of cork and other stoppers and useful articles, but confining always*” the “ *claim as regards caoutchouc to the use of the same in combination with gutta percha, or when combined by itself with ground cork or wood sawdust, for the purpose of being manufactured into cork and other stoppers.*”

Second, “ *the employment of gutta percha in any of the states, or according to any other methods before described in the manufacture of cork and other stoppers and useful articles; and*”

Third, “ *the making of corks and other stoppers and useful articles of common cork, cased or coated in manner*” described “ *with the said new composition, or with a mixture of ground cork, and any suitable oil or varnish, or with caoutchouc alone, or gutta percha alone, or with a mixture of caoutchouc and gutta percha, excepting always stoppers made of fibrous materials, in so far as respects the application of caoutchouc alone.*”

By a Memorandum and Disclaimer enrolled June 10, 1851, the parts printed in italic above were struck out of the Specification, and all parts relating to the same were struck out; and likewise the part describing “ *the use of treacle and glue in the manufacture of cork and other stoppers and useful articles,*” is struck out.

The new composition is made by rasping or grinding the cork to powder, or sawdust may be used; the gutta percha by itself, or with caoutchouc, is either dissolved by a solvent, such as is used for dissolving caoutchouc, and is mixed with cork or sawdust; or it may be put into a masticating machine in the solid state with the other substances, and, after mastication, put into square moulds, afterwards to be cut into corks; or it is moulded at once into corks or stoppers, or useful articles, into which the same is intended to be formed, &c. Gutta percha alone, or combined with caoutchouc, is manufactured by similar processes as in

manufacturing caoutchouc by itself, and is applied to similar useful purposes.

[Printed, 6d. See Repertory of Arts, vol. 9 (*enlarged series*), p. 54, and vol. 18 (*enlarged series*), p. 80, for Disclaimer; London Journal (*Newton's*) vol. 26 (*conjoined series*), p. 81, and vol. 40 (*conjoined series*), p. 237.]

A.D. 1844, July 24.—N° 10,270.

BROCKEDON, WILLIAM.—“Improvements in covering the roofs of buildings, in covering the valves used when propelling by atmospheric pressure, in covering the sleepers of railways, and in covering parts of stringed and keyed musical instruments;” and these are, employing for these purposes caoutchouc mixed with sulphur and calamine in certain proportions, by passing through rollers, and made into sheets by rolling. These sheets are subjected to a high degree of temperature; “such process of treating india rubber having already been made the subject of a Patent to Mr. Thomas Hancock” N° 9952. It is understood that this “invention consists of certain new mechanical adaptations.”

[Printed, 4d. See Repertory of Arts, vol. 5 (*enlarged series*), p. 241; London Journal (*Newton's*), vol. 28 (*conjoined series*), p. 183; and Engineers and Architects' Journal, vol. 8. p. 159.]

A.D. 1844, September 26.—N° 10,327.

CASSELL, EDWIN EDWARD.—“A material, or composition of materials, suitable for paving, piping, roofing, and most other purposes for which wood and iron are applicable.” The material applicable to paving, flooring, and other like purposes, is composed of four varieties of compounds, as follows:—No. 1, chalk, marl, or lime, loamy clay, or sandy earth, is saturated with oil of tar, mineral tar, &c.; this is mixed in a cauldron with a certain quantity of melted rosin, a certain quantity of liquid caoutchouc is added, or “essential oil of tar or turpentine, sulphur, and fine dry grit.” No. 2 is the same as No. 1, only vegetable pitch is substituted for the rosin, and more sulphur is added. No. 3 is similar, only equal parts of rosin and Stockton tar instead of vegetable pitch, and the sulphur reduced. No. 4 compound differs from No. 3 in having mineral tar for vegetable. These are cast into blocks, and the mode of doing so is fully described. “Water pipes, drains, sewers, &c.” are made of any of the four compounds in a manner which is also given; also

78 INDIA RUBBER AND GUTTA PERCHA :

“ casks, tanks, cisterns, garners, &c. railway sleepers, &c.” For roofing, No. 5 compound consists of rosin, vegetable pitch, or Stockton tar, or mineral tar, fine grit, sulphur, cork cuttings or raspings, all in certain proportions, and made into sheets. No. 5 “ may be also usefully employed ” “ for the prevention or lessening of noise ” on “ roads and railways ; ” the mode of employing it is described.

A good substitute for firewood, No. 6. This consists of resinous matter, &c., cork cuttings, &c., chips of wood, shavings, small coal, salt, manganese, sulphuric acid, in certain proportions, mixed in a cauldron, and pressed into sheets, &c.

[Printed, 11*d*. See *Mechanics' Magazine*, vol. 42, p. 329; and *Engineers and Architects' Journal*, vol. 8, p. 223.]

A.D. 1844, September 26.—N° 10,330.

COTTER, JOHN BERKELEY. — “ Improvements in the preparation and manufacture of woven fabrics or tissues applicable “ to various useful purposes ; ” and these consist in saturating the fibres, whatever they may be, “ intended to form both the “ waft and the weft, 'or either of them,” in a solution of the following substances, mixed in certain proportions, and in certain manner :—Boiled linseed oil, white lead, raw charcoal in powder, litharge, chloride of sodium ; and they are worked “ in such saturated state.” The same composition is applied to yarns, &c., whatever may be the purpose for which they are required, “ and “ to any textile fabric already manufactured in the usual “ manner,” rendering them repellent of water.

[Printed, 3*d*. See *London Journal (Newton's)*, vol. 27 (*conjoined series*), p. 255.]

A.D. 1844, November 25.—N° 10,407.

ALSOP, WILLIAM, and FORSTER, THOMAS. — “ Improvements in the manufacture of elastic fabrics, and in making “ articles from elastic fabrics, and for weaving fabrics for the “ driving bands of machinery, and other uses ; ” and these are,—first, “ weaving a single or double faced satin cloth with india “ rubber applied as weft.” This is done in a common loom. Into it put a warp of silk, cotton, &c. having five, six, seven, or more harness shafts for the same, these shafts being moved by ten treadles or more moving alternately three or two or other numbers.

Second, "cementing twisted strands of india rubber," or a composition of india rubber, such as is described in the Specification of Patent N° 10,092, "between fabrics or leather or combinations of them."

Third, making "woven elastic fabrics by applying india-rubber thread, or the compositions of india rubber above mentioned, twisted as a twine or cord in two, three, or more strands."

Fourth, "cutting india-rubber, &c. threads by a circular knife cutting against a cylinder or drum.

Fifth, "a satin-faced non-elastic band made of cotton, flax, worsted, or any suitable material," the "improvement being the protection of the shute from friction by bringing the utmost quantity of the warp in contact with the work."

[Printed, 6d. See Repertory of Arts, vol. 6 (*enlarged series*), p. 77.]

A.D. 1845, January 11.—N° 10,460.

PERRY, STEPHEN.—"Improvements in the application of springs to locks and other fastenings, to paper-holders, to candle-lamps, to blinds, window sashes, and doors, and to seats and elastic surfaces for sitting and reclining upon;" and these are said to consist in applying springs to all these things, such springs being made "of a certain preparation of india rubber (caoutchouc)" "known under the name of 'vulcanized india rubber,'" such manufacture being secured to "Mr. Thomas Hancock" in Patent N° 9952.

[Printed, 1s.]

A.D. 1845, March 11.—N° 10,550.

BROOMAN, RICHARD ARCHIBALD (*a communication.*)—"Certain improvements in the preparation and application of artificial fuels, mastic, and cements;" and these are said to be employing in the manufacture of such substances "the natural resin, resin-like substance, or mastic called gutta percha, sometimes gutta tuban," and applying such artificial fuels, mastics, and cements to various purposes.

Artificial fuels may be composed of gutta percha, alone or in certain proportions, and one, two, or more of the following substances, also proportioned:—Small coal or coal dust, pitch from coal tar, sawdust or other ligneous fibre, coal tar. A fuel of gutta percha and coal tar yield, on burning, "a black pigment



80 INDIA RUBBER AND GUTTA PERCHA :

“ suitable for the manufacture of printing ink.” A fuel of gutta percha and caoutchouc is suitable for the same purpose.

**Artificial Mastics and Cements.**—The gutta percha is first purified by soaking, and passing several times through a cleansing machine consisting of a tank with water and steam and rollers described. When clean it may be applied as above, or in a granular or pulverized state, or in a state of solution, either alone or combined with other substances.

**Plastic Applications.**—After cleansing as above, the gutta percha is subjected to the operation of a kneading machine much resembling the masticator for caoutchouc; and if certain properties are required, it is mixed with certain things and in certain proportions, as caoutchouc, sulphur, pigments, and colours. Pulverized French or Turkey chalk, &c. improves its smoothness, and emery roughens it. Alone or mixed it may be manufactured by moulding, stamping, embossing, casting, &c. into various articles. In this plastic state, or in solution, it may be used for all the purposes to which caoutchouc has been applied, and applied by much the same machines.

**Granular Applications.**—Taking casts and busts and impressions in relief from flat surfaces engraved or perforated as described.

[Printed, 11d. See Repertory of Arts, vol. 7 (*enlarged series*), p. 214; London Journal (*Newton's*), vol. 28 (*conjoined series*), p. 235; and Mechanics' Magazine, vol. 44, p. 22.]

A.D. 1845, March 13.—N° 10,552.

**NICKELS, CHRISTOPHER.**—“Improvements in the manufacture of elastic webs and cords, and in the mode or modes of manufacturing articles from the same;” and these are, first, “in manufacturing narrow elastic webs and cords by the use of india rubber as a weft,” by employing weft-engine looms, and “employing india-rubber strands or threads as weft with warps of cotton, silk, or other fibrous material,” preferring “that the india-rubber strands used as weft should not be covered.”

Second, applying “india-rubber threads or yarns in combination with a mode of cross-weaving.” “The warps of silk, cotton, or other fibrous material employed are wound upon a beam at the back of the loom in the ordinary manner; and strands of india rubber, forming part of the warp, are wound upon another beam in a similar manner. The strands of silk,

“ cotton, or other fibrous material are divided, and pass through a pair of heddles, and then through half-leaves and standards in the ordinary manner. The strands of india rubber are supported by a frame or heddle, so as that they may be raised and lowered to enable the shuttle alternately to pass under and over them.”

Third, the introduction of india-rubber threads wherever it may be thought necessary, covered or uncovered, as weft in cross-weaving generally;” “and for this purpose,” “withdraw the shuttle with weft of silk, cotton, or other fibrous material, and introduce a shuttle containing covered india-rubber thread, and proceed to use such india-rubber thread as weft, as in the ordinary process of cross-weaving;” when it is wished “to use uncovered india-rubber thread, place an extra harness at the back, and bring it in while making the sheath, as is well understood and adopted in the ordinary mode of covering the shute.”

[Printed, 7d. See Repertory of Arts, vol. 7 (*enlarged series*), p. 40; and London Journal (*Newton's*), vol. 27 (*conjoined series*), p. 238.]

A.D. 1845, March 17.—N° 10,563.

PERRY, STEPHEN, and DAFT, THOMAS BARNABAS.—“Improvements in springs to be applied to girths, belts, and bandages, and improvements in the manufacture of elastic bands;” and these improvements consist in applying to these articles springs made of “vulcanized india rubber,” made under Mr. Thomas Hancock’s Patent, N° 9952. Certain forms of springs, &c. are given, according to the article for which they are required.

[Printed, 9d. See Repertory of Arts, vol. 7 (*enlarged series*), p. 211; and London Journal (*Newton's*), vol. 27 (*conjoined series*), p. 256.]

A.D. 1845, March 27.—N° 10,582.

BROOMAN, RICHARD ARCHIBALD (*a communication*).—“A thread made from a substance not hitherto applied to that purpose, and also the application of it to the manufacture of piece goods, ribbons, paper, and other articles.” The substance is “the resinous or resin-like substance called gutta percha,” and it is applied “to the manufacture of piece goods, ribbons, paper, and other articles.”

## 82 INDIA RUBBER AND GUTTA PERCHA :

The gutta percha, if necessary, is purified and prepared with sulphur, &c., &c. as described in N° 10,550, and threads are cut from it in the sheet "by means of revolving circular knives, " according to the well-known modes followed in the cutting of " bottle or sheet caoutchouc into threads." These are rounded " by twisting, &c., or round threads may be obtained by employing a machine described. A roll of prepared gutta percha is put into a cylinder with a die box ; a piston is placed over the gutta percha, and pressed upon it, presses it against the die box which is hot, the gutta percha is pressed out in threads, which fall into a tank with water below, and are cooled. The threads are wound upon reels. The thread "may be applied to the " manufacture of piece goods, whether by weaving, frame-knitting, or netting, either by itself or in combination with silk, " cotton, flax, wool," &c., or it may be naked or covered with silk, cotton, flax, wool, &c.

A paper, &c. very strong, is made by interposing, between two sheets of paper, pulp threads of gutta percha laid crosswise, like network, and combining the two sheets by means of the machine for which Mr. John Dickinson obtained Letters Patent, N° 8242, or any other suitable machinery.

" The gutta percha thread may also be plaited, either in the naked " or sheathed state, into hats, caps, and bonnets, bags, baskets, " basket-work, or into coverings for chairs," " whips, bridles, " and reins, and cordage, by twining with threads of flax," &c.

[Printed, 7d. See Repertory of Arts, vol. 8 (*enlarged series*) p. 363 ; London Journal (*Newton's*), vol. 27 (*conjoined series*), p. 33 ; and Mechanics' Magazine, vol. 44, p. 238.]

A.D. 1845, March 28.—N° 10,583.

TYLOR, HENRY.—" Improvements in fabrics used for and " applicable for curtains, screws, blinds, and other like useful " purposes ;" and these are, first, manufacturing " two sheets or " pieces of some transparent material or materials, permanently " united together, one of which is perforated with holes, accord- " ing to any pattern or design, and the other is left unperforated." The sheet, in preference of paper or pasteboard, is perforated, and pasted on to another sheet. They are passed between rollers.

Second, manufacturing two sheets, as above, only the unperforated sheet is coloured different " from the other, and one or " both of them is opaque." The colour and opaqueness may be imparted to the paper in the pulp or otherwise.

Third, "manufacturing for the same purposes the double fabrics of either of the descriptions aforesaid, rendered impervious to wet by the application of caoutchouc." This is to be effected "by any of the well-known methods practised in the manufacture of caoutchouc waterproof cloths."

Fourth, manufacturing "fabrics for the purposes of dwarf window blinds, composed of two or more sheets of paper, with a sheet of linen cloth interposed between and permanently united to them and perforated in patterns through and through."

[Printed, 4d. See London Journal (*Newton's*), vol. 29 (*conjoined series*), p. 39.]

A.D. 1845, April 22.—N<sup>o</sup> 10,632.

NORMANDY, ALPHONSE LE MIRE DE.—"Improvements in dissolving lac and shellac, and in rendering fabrics waterproof;" and these are, first, treating the alkaline solution of "lac with sulphuric or other acids, so as to obtain the lac in a solid, semi-solid, or viscid form, from the said solution; and, second, using the potatoe or grain oil, called hydrate of protoxide of amyle, for the purposes of dissolving lac or shellac, or the lac obtained by the action of sulphuric acid upon the alkaline solution."

The plastic mass by sulphuric acid, &c. from the alkaline solution is applied to fabrics. Or solutions of same, &c. are applied. It is stated that "this plastic mass is also soluble in naphtha and alcohol."

[Printed, 3d. See Repertory of Arts, vol. 6 *enlarged series*, p. 311; and London Journal (*Newton's*), vol. 29 (*conjoined series*), p. 36.]

A.D. 1845, May 8.—N<sup>o</sup> 10,661.

McINTOSH, JOHN.—"Improvements in preparing materials for coloring and printing calicoes and other fabrics, and improvements in printing and ornamenting fabrics." These are, first, combining flock and a solution of india rubber, or a solution of gutta percha, and using the same as a printing material for calico and other fabrics." The solution, in preference, is made with naphtha; flock of the desired color is added; and the printing performed "by means of engraved rollers or plates."

Second, "the mode of cleansing engraved printing rollers or plates with a roller or surface of india rubber." By pressing a roller of india rubber into the engraving.

84 INDIA RUBBER AND GUTTA PERCHA:

Third, "the application and spreading of color from a trough or vessel open at bottom on to a sieve cloth, and further spreading it by brushes."

(See "Abridgments of Specifications on Bleaching, Dyeing, and Printing.")

[Printed, 8d. See Repertory of Arts, vol. 7 (*enlarged series*), p. 17; and London Journal (*Newton's*), vol. 27 (*conjoined series*), p. 336.]

A.D. 1845, May 20.—N° 10,673.

NICKELS, CHRISTOPHER.—"Improvements in binding and covering books, pamphlets, portfolios, writing cases, and other similar articles;" and these are instead of sewing, glueing, or stitching, and pasting, sizing, guming, glazing, and colouring or marbling the edges and covers of books, &c. in the usual way in the processes of book-binding, &c., using a solution of gutta percha; and using "gutta percha in the sheet as a substitute for vellum, leather, paper, and cloth in binding and covering," these articles.

The solution, and gutta percha sheet, &c. are prepared by the process followed in Patent N° 10,550.

[Printed, 3d. See Repertory of Arts, vol. 9 (*enlarged series*), p. 165; London Journal (*Newton's*) vol. 28 (*conjoined series*), p. 33; and Mechanics' Magazine, vol. 44, page 253.]

A.D. 1845, May 22.—N° 10,682.

CLARK, JAMES.—"Certain improvements in the manufacture of fabrics from fibrous materials;" and these are, first, "producing fabrics of a continuous length by means of threads of silk, wool, cotton, hemp, flax, &c., and any other suitable fabric or material, and india-rubber cement or cementing materials generally."

Second, treating gutta percha, as described.

Third, "cementing a body of fibrous material, continuously produced as described, by means of india-rubber cement, or gutta percha, or pitch, or tar, or paste, or dissolved shellac, or lac, or a combination of these or any other suitable cementing materials," &c.

Fourth, cementing a series of layers of fibrous material, as produced, description in N° 9624, by means of the above cementing materials.

In carrying out the first part of the Invention, a roll of fabric, in passing to two rollers, has distributed by a metal hopper or feeder india-rubber cement upon it. After passing through the two rollers, it is met by woollen yarn, and, passing with it through the rolls, the fabric and yarn are united together so as to form one material.

In carrying out the second part of the invention, gutta percha steeped in boiling water is kneaded by the hand into a mass twelve inches long and two inches broad, and made into a web by passing between heated rollers; and this web passed through heated rollers with the woollen yarn, they are united into one fabric.

In carrying out the third part of this invention, a machine is described by which a continuous series of layers of fibrous materials are produced, and which is said to be an improvement upon a former machine described in N° 9624. It consists of a series of cylinders, &c. worked as follows:—The cotton scutched is put into the feeder, the first cylinder passing round catches the fibres of the cotton, and delivers them on to a smaller cylinder, which, moving at a less speed than the larger cylinder, accumulates, and delivers a thick body of fleece to the feeding of another cylinder from this on to another roller, and afterwards through the cementing rollers.

A body of fleece can be also produced “from a drawing frame similar to what is used in cotton spinning.”

[Printed, 6d. See Repertory of Arts, vol. 7 (*enlarged series*), p. 29.]

A.D. 1845, May 29.—N° 10,692.

KEENE, CHARLES.—“Improvements in boots, shoes, gaiters, “overalls, and other like articles of apparel;” and these are, first, “coating or covering, either wholly or partially,” boots &c. “with gutta percha.”

Second, “interposing gutta percha in any of its sheet states “between other materials in the making of boots,” &c.

Third, employing, in the manufacture of boots, &c. compound fabrics described.

Fourth, making boots, &c. “all in one piece, or in two or more “pieces, by casting.”

Fifth, uniting the parts of boots, &c. “when any two parts, or “any one of two parts, are or is composed of gutta percha in any

" of its states of preparation or combination, by cementing instead of sewing or stitching them together."

Sixth, "sulphurizing the said boots, &c., when made of unsulphurized caoutchouc or gutta percha," by exposing them to the fumes of sulphur from half an hour to an hour in a close vessel, or immersing them in a bath of melted sulphur.

Seventh, improving the shoes of horses by the addition of sheets or layers of sulphurized gutta percha or caoutchouc, or by making them wholly of either of these materials.

The gutta percha is prepared according to processes described in Specification of Patent N° 10,550.

The fabrics mentioned in the third improvement are gutta percha combined or not combined with caoutchouc or sulphur, &c. with a portion of leather, dust, or horsehair, or bristles, or ground cork, or woollen shavings, &c.; also, fabrics made by saturating a but or fleece of cotton, wool, &c. with a solution of gutta percha, &c.

[Printed, 4d. See Repertory of Arts, vol. 9 (*enlarged series*), p. 170; London Journal (*Newton's*), vol. 28 (*conjoined series*), p. 432; and Mechanics' Magazine, vol 44, p. 269.]

A.D. 1845, May 21.—N° 10,694.

MASTERS, JOHN.—"Certain improvements in trowser fastenings, and in attaching the same, and also in the application of an elastic material or fabric to trowsers and other articles of dress;" and these are, first, "The improvement in trowser fastenings" consists in attaching at the bottom of each leg of the trowsers "and on the inside a pair of eye plates." The trowser straps have attached to them hook plates, for the purpose of attaching them to the eye plates. Second, "the manufacture of braces," connecting them at the back by lacing them in manner similar to lacing of stays. Third, "applying pieces to trowsers and waistcoats;" inserting into these articles pieces of fabric "made in whole or in part of caoutchouc, or a preparation of caoutchouc or gutta percha, or a preparation of gutta percha." Fourth, "using, in the manufacture of gloves in place of fourchettes and quirks of the same material as the rest of the glove, some elastic fabric," such as above.

[Printed, 5d. See London Journal (*Newton's*), vol. 28 (*conjoined series*), p. 169.]

A.D. 1845, July 10.—N° 10,760.

BOSSY, ANTOINE.—“Improvements in manufacturing water-proof paper,” which consist in submitting the pulp to repeated solutions or compositions. These are composed of the following substances, combined in a certain manner and in certain proportions, “psylum (a drug well known to chemists),” water, soap made from rosin or palm or cocoa-nut oil, &c.” Second solution, sulphate of alumina. A third solution, same as first. A fourth solution, same as first; after which it is beat, sized with vegetable size, “or, in place of vegetable size, animal may be used when the “ paper is sufficiently dry.”

[Printed, 3d. See Repertory of Arts, vol. 8 (*enlarged series*), p. 99; London Journal (*Newton's*), vol. 28 (*co-joined series*), p. 78; and Patent Journal, vol. 1, p. 182.]

A.D. 1845, July 21.—N° 10,774.

WILLIAMS, THOMAS ROBINSON.—“An improved process and “ machinery for rendering paper and wrappers waterproof;” and this is effected “by covering one side or surface of such “ paper or fabrics with a coat or layer of a bituminous, resinous, “ or gummy material or composition,” and which materials are “ dissolved by the application of heat alone,” and “causing the “ surface of the sheets or lengths of paper or fabric so coated or “ prepared to adhere, by bringing the coated, &c. surfaces into “ contact, and affecting a perfect union by pressure.” The bituminous, &c. substances “are vegetable pitch and tar, mineral pitch “ and tar, as made from coal tar, the native asphaltes of Egypt, “ Bastenne, Trinidad, and other places,” “as well as all resins or “ gums which liquify by heat,” are insoluble in water, “and have “ not been used and applied for similar purposes.”

The “machinery for producing the double or waterproof “ fabric” consists of arrangements of rollers with a cloth. The cloth passes between rollers which dip into a trough containing the bituminous composition, and pass up between pressing rollers, &c.

[Printed, 10d.]

A.D. 1845, August 28.—N° 10,820.

NEWTON, ALFRED VINCENT (*a communication*).—“Improvements in machinery for manufacturing india-rubber fabrics;”



## 88 INDIA RUBBER AND GUTTA PERCHA :

and these are said to be, first, employing "a series of knives or cutters in combination with a small grooved roller, upon which the india rubber to be cut is pressed in a smooth and even state," by which arrangement the sheet may be divided into threads suitable for being worked up into india-rubber fabrics. Second, the general arrangement of "machinery for stretching threads of india rubber, and covering the same with suitable textile fabrics," by means of "a combination of rollers or drums. The manufacture is "corrugated or 'shirred' india-rubber goods.

[Printed, 10d. London Journal (*Newton's*), vol. 29 (*conjoined series*), p. 325.]

A.D. 1845, September 4.—N° 10,825.

BEWLEY, HENRY.—"Certain improvements in flexible syringes, tubes, bottles, hose, and other like vehicles and vessels;" and these are said to consist neither "in the modes of preparing the gutta purcha," nor "any of the modes of giving it form and figure," but in applying gutta percha, in any of the states and "by any of the processes before specified to the manufacture of" the above articles, "or to the improvement of such articles after manufacture."

Gutta percha is employed "either in its natural liquid state, or in an artificial state of solution, or in a plastic state, or in a sheet state, or in a granular state, or in a state of combination with other substances, one, two, or more." It is brought into these states by the means directed to be used for the purpose in the Specification of Patents, N° 10,550 and N° 10,582.

These articles may be made wholly or partly of gutta percha, or of other elastic substances and covered with gutta percha. Tubes, hose, and such-like articles are made by a machine described as follows:—The gutta percha in a plastic state is put into a cylinder, and a piston working into this cylinder presses the gutta percha against a heated disc in which there are holes through which the gutta percha is pressed into a cup, "from whence it passes out round a core, and descends of the desired tubular form into a receiver of cold water."

[Printed, 6d. Repertory of Arts, vol. 9 (*enlarged series*), p. 295; London Journal (*Newton's*), vol. 31 (*conjoined series*), p. 214; and *Mechanics' Magazine*, vol. 44, p. 319.]

A.D. 1845, October 10.—N° 10,879.

**TAYLOR, JAMES.**—"Certain improvements in the manufacture of "carpets, rugs, and piled fabrics;" and these are said to be, first, employing a "beam or roller for winding on the threads or yarn "of wool or worsted, to form the pile of cemented pile fabrics;" and also the use of a "collar for compressing the threads laterally while being wound on the beam and roller. Second, "laying such coils of threads out flat in layers, ready to be worked "up into piled fabrics, as required." "The threads are altogether "detached from the roller, and laid flat on a table" for the purpose; "every succeeding beam is stripped in like manner until "a sufficient number of layers are placed to make up the pattern," "as the layers of wool are placed above each other, the table is "proportionably depressed." Ultimately "the mass of woollen "yarn or thread" is pressed "into a proper consistency," and "the ends are caused to protrude a certain distance," "so that "the cement of india rubber or other adhesive substance may be "applied." No claim is made to the mode of pushing out the wool to be cemented, "nor to the cementing of the same to the "fabric which forms the back of the rug or carpet."

[Printed, 1s. 3d. See London Journal (*Newton's*), vol. 29 (*conjoined series*), p. 107.]

A.D. 1845, October 23.—N° 10,894.

**FULLER, WILLIAM COLES.**—"Improvements in the construction of carriages for railways;" and these consist, first, "in placing "a cushion, with or without springs, at each end of a railway "carriage, and covering the whole or the greater part of each end "of it in such a manner, that in case of a collision of a train, the "cushions," &c. "may diminish the effect of the concussion."

The cushions are stuffed with wool, cocoa nut fibre, india rubber, &c.

Second, applying india-rubber springs to buffers, and applying india rubber as springs for supporting the bodies of railway carriages. In the first place, springs for buffers are made of alternate discs of india rubber, and thin plates of metal, packed closely, these may be placed at different parts of the buffer. The springs to the bodies of the carriages are straps of india rubber, laid between two racks, consisting of a number of strong horizontal teeth, one rack resting on the axle box, and the other suspended from

90 INDIA RUBBER AND GUTTA PERCHA:

the body of the carriage. Either of the boxes may be constructed with bars or pins, instead of teeth, or india rubber may be "arranged in layers."

[Printed, 1s. 1d. See Repertory of Arts, vol. 9 (*enlarged series*), p. 87; and London Journal (*Newton's*), vol. 29 (*conjoined series*), p. 10.]

A.D. 1845, October 27.—N° 10,897.

NICKELS, BENJAMIN.—"Improvements in pianofortes;" and, these are said to be, first, "constructing these instruments so as to combine in one instrument two separate sounding boards with two sets of springs and actions, together with one or two sets of keys."

Second, applying "additional bass strings, in combination with an action brought into motion by the feet of the performer."

Third, applying "coiled or helical springs, and also springs of india rubber, to bring back the hammers of pianofortes." The springs of india rubber are in preference, made of vulcanized india rubber.

Fourth, "The mode of constructing apparatus for tightening and tuning the strings of pianofortes."

Fifth, covering the wires of these instruments "with india rubber, gutta percha, and catgut, and combining several wires, covered or uncovered, by binding them so as to form them into one string." In coating wires with india rubber and gutta percha, this may be done in various ways, but it is preferred to cover them with fine threads of either of these substances, and the india rubber it is preferred to use is "vulcanized, or otherwise proofed against different atmospheres."

Sixth, "applying short lengths of felted cord to the hammers of pianofortes, and also the use of a hollow or tubular head to the hammer."

[Printed, 5s. See Repertory of Arts, vol. 8 (*enlarged series*), p. 129.]

A.D. 1845, November 3.—N° 10,917.

WATNEY, ALFRED.—"Improvements in the manufacture of horseshoes, and in applying shoes to horses and other animals," and these are, first, "the mode of manufacturing shoes for horses and other animals from iron and steel, rolled into bars in such a manner that the steel may come to the wearing surface."

Second, the mode "of running cast steel into a mould against a hot bloom of iron prepared to receive it," and "thus forming

“ a pile of steel and iron to be subsequently rolled into bars for the shoes.”

Third, applying vulcanized india rubber between “ the shoe and hoof, in any form that may be found desirable.”

[Printed, 6d. See Repertory of Arts, vol. 7 (*enlarged series*), p. 338; and Patent Journal, vol. 1, p. 7.]

A.D. 1845, November 11.—N° 10,935.

BIELEFELD, CHARLES FREDERICK.—“ Improvements in the manufacture of embossed or pressed paper, calico, leather, and other fabrics and articles;” and these are said to consist of three; namely,—

First, manufacturing mouldings from paper, calico, and other woven fabrics, and “ from suitable preparations of fibrous materials in a plastic state, and also from leather combined with other matters by the employment of rollers as described.”

Second, using woven fabrics, when combined with paper, papier mâché, or other plastic preparation of fibre in the manufacture of mouldings and embossed articles similar to papier mâché, and applying papier mâché, &c. in giving extra thicknesses to certain parts of the article to obtain strength and stiffness; and this, it is stated, “ is applicable when making articles of thick paper.”

Third, applying india rubber, combined with glue, treacle, glycerine, or gluten, in preparing plastic matters of fibrous materials, when made into articles, by pressing in moulds or embossing by rollers, as described above, “ or combined with paper, leather, calico, or other woven fabric.”

[Printed, 4d. See Repertory of Arts, vol. 7 (*enlarged series*), p. 352; and Patent Journal, vol. 1, p. 63.]

A.D. 1846, January 12.—N° 11,032.

HANCOCK, CHARLES.—“ Certain improvements in the manufacture of gutta percha, and its applications alone and in combination with other substances,” and these are, first, “ preparing gutta percha for manufacturing purposes;” and this is effected as follows:—If the gutta percha requires cleansing, it is submitted to the process described in N° 10,550; if otherwise, it is placed “ in a plastic state in a cylinder screw press, kept hot by a steam jacket, and having a bottom perforated

"with numerous holes." Upon this perforated bottom are placed one, two, three, or more strainers, and it is squeezed through them "either once or twice, or as much oftener as may seem expedient;" or the gutta percha, as imported, may be dissolved in a solvent, and filtered, while warm, through flannel, felt, or fine wire gauze, after which distil off the solvent, &c.

Second, combining gutta percha with jintawan and caoutchouc, or jintawan alone. This is done, in the usual way, by means of a masticator.

Third, combining orpiment and other sulphurets, or sulphur, with gutta percha and the above substances. The mixture is made in the ordinary masticating machine. When heated to a high temperature for some time, either "by high-pressure steam, or of water heated under pressure, or of hot air," a substance is obtained much more lasting than when the heating is dispensed with.

Fourth, manufacturing gutta percha and its compounds into "porous or spongy substances." This is effected by mixing the article intended to be made spongy with a quantity "of alum, carbonate of ammonia, or some readily volatilizable substance, either in the" masticator or by other means. Putting into moulds of the shape required, and heating in an oven, it swells up, and becomes spongy.

Fifth, "manufacturing gutta percha and its compounds into hard substances," by confining the mass in moulds, and keeping these moulds in a chamber raised to a high temperature for some days.

Sixth, "rendering gutta percha and its compounds softer and more pliable by treating it with an acid," by exposing them to sulphurous-acid gas, or steeping in a solution of sulphurous acid, or covering with a paste of sulphuric acid and some charcoal, and placing in a steam-heated chamber or vessel."

Seventh, "rendering gutta percha and its compounds softer and more pliable by the addition of wax, tallow," &c.

Eighth, two varnishes and the mode of forming them: for these purposes, gutta percha or its compounds are to be dissolved by heating under pressure to a temperature of from 300° to 380° Fahrenheit; or gutta percha and its compounds, animal or vegetable wax, or animal and vegetable fatty matter, are dissolved in turpentine and evaporated.

Ninth, "the mode of plating or coating gutta percha or its

"compounds with metals." A sheet, say of gold leaf, is placed on a metal plate, the plate is laid on a sheet of the gutta percha or its compounds, and a strong pressure and heat applied.

Tenth, "improved apparatus for making bands." The gutta percha, &c. passes through rollers set to a width according to the thickness of the sheet required, and is wound on to a drum, and as it is wound on this drum it receives on its surface from another drum or roller a sheet of cotton, cloth, &c. After cooling this, the double fabric passes to another roller over a roller with an arrangement of knives adjusted, by which it is cut into bands. In some cases the bands are made by spreading the cloth with gutta percha, &c. by flattening mills, &c. and united again and again by passing together through rollers heated.

Eleventh, making cards for carding wool, &c. of metal, both set in backs composed of gutta percha, or some of its compounds, laid on cloth or felt, or other similar foundation.

Twelfth, "combining gutta percha and its compounds with resinous and bituminous matters," by mixing with it in the masticating machine shell lac, resin, asphalt, &c.

[Printed, 7d. See Repertory of Arts, vol. 8 (*enlarged series*), p. 164; Mechanics' Magazine, vol. 45, p. 138; and Patent Journal, vol. 1, p. 164.]

A.D. 1846, January 20.—N<sup>o</sup> 11,055.

BURKE, WILLIAM HENRY.—"Certain improvements in the manufacture of fabrics, which may, if required, be made air and water proof; a part of the materials employed herein, when combined with other matters, being intended to produce covering for vessels of capacity;" and these are, first, uniting, by "means of gum elastic, a certain substance called 'Clark's cloth,' with woven or felted fabrics, for the purpose of imparting thereto, when coated with a composition of materials," a "smooth, compact, and, if required, waterproof surface."

Second, "the mode of producing a continuous fleece of cotton wool, and combining such fleece in an indefinite length, by means of gum elastic, with woven or felted fabrics, and rendering the same smooth, compact, and waterproof, by a dressing on the face."

Third, combining "paper with Clark's fabric," or combining "paper with a continuous fleece of cotton wool, cemented by gum elastic," for the purpose of giving strength, &c.

Fourth, "a membranous material, coated or impregnated with pulverized metal."

Any desired length of woven or felted cloth is wound upon a roller, and placed in connexion with a corresponding length of Clark's cloth, made according to description in Specification of Patent, N° 9624, "also wound tightly upon a roller. These cloths are conducted together between pressing rollers. At the pinch of these rollers a quantity of caoutchouc, or other gummy material composed of certain proportions of caoutchouc or gutta percha, made plastic by rolling or masticating in a warm state, and further softened by spirits of naphtha or turpentine," is placed along the whole length of the rollers; this cements the two cloths firmly together. The combined cloth is wound upon a receiving roller. The motion of the rollers is then reversed, and the combined cloth passed between them, at which time a further supply of the caoutchouc compound is applied upon Clark's cloth; when the fabric is dried, and is fit for use as a waterproof covering." Instead of employing Clark's cloth, a series of slivers of cotton wool, conducted from a series of carding engines, are passed through pinching rollers and united to the cloth, and coated as above described, &c.

Instead of woven or felted cloth, paper may be employed and combined. Paper so prepared may be coloured, embossed, and ornamented, and thereby rendered fit for the coverings of books, boxes, envelopes, buttons, &c.

A membranous material, resembling thin metal, is made by taking a thin quality of Clark's cloth coated with the composition above, or, instead of that, one, two, or more slivers of wool are treated as above; and when the thin membranous material is produced, the "surface is washed over with a solution of gutta percha or caoutchouc in spirits, containing fine powdered metal, as gold dust, silver, bronze, copper, tin, &c." Or gutta percha, or caoutchouc, or their compounds, are rolled, without any cloth, water being used during rolling to prevent adhesion, and the surface washed with the metallic solution; or the gold dust, &c. is mixed with the plastic material during preparation, and it is rolled into sheets. The latter material is generally applied "to making the coverings" for bottles, jars, &c., by modelling upon blocks, &c.

[Printed, 7d. See London Journal (*Newton's*), vol. 30 (*conjoined series*), p. 81.]

A.D. 1846, February 11.—N° 11,087.

WHARTON, WILLIAM.—“ Certain improvements in straps and “ bands;” and these are, “ forming straps or bands for harness, “ suspending carriages, driving machinery,” &c., by combining “ metal wires with leather or gutta percha, or with leather and “ gutta percha together.”

The wire is fixed in strands or coils, and hanks. The leather is joined by stitching; gutta percha may be joined in the same way, “ or by heating and compressing the surfaces together.”

[Printed, 10d. See Repertory of Arts, vol. 13 (*enlarged series*), p. 248; and Patent Journal, vol. 1, p. 213, and vol. 6, p. 190.]

A.D. 1846, February 17.—N° 11,093.

KLOET, JACQUE.—“ A certain improved combination of materials to be used as a substitute for leather, or for waterproof cloth, and other similar purposes:” and this “ consists chiefly “ in a preparation of linseed oil,” “ in combination with a solution “ of caoutchouc or indian rubber, and other ingredients.” The preparation of the linseed oil is to boil it with “ bread,” and when the bread rises to the surface it is to be taken out, having “ taken “ up and absorbed all the impurities.” “ Spirit of turpentine is “ then added to it, and ignite it for a short time, and cover it up.” This is used with a solution of caoutchouc in turpentine, by rubbing upon cloth in a certain manner, with acetate of lead and a little drying oil. Lampblack is also an ingredient, and pumice stone is employed in smoothing the surface.

[Printed, 3d. See London Journal (*Newton's*), vol. 30 (*conjoined series*), p. 112.]

A.D. 1846, March 11.—N° 11,132.

ROBINSON, CHARLES ROBERT, and BOWDEN. THOMAS.—“ Certain improvements in machinery for washing and cleansing cotton, linen, or woollen fabrics;” these consist “ of “ modes of combining machinery used in washing and cleansing “ cotton, linen, and woollen fabrics, so as to bring into action “ certain beaters, and also combined with such beaters jets of “ water.” One of these beaters is termed a “ flexible beater,” and consists “ of a revolving axis,” “ having several beaters (arms) “ affixed thereto, which may be of strong canvass or other strong “ material, thickened at the outer edges, which may be covered



96 INDIA RUBBER AND GUTTA PERCHA:

“ at the beating edges with what is called vulcanized india rubber.”

(See “ Abridgments of Specifications upon Bleaching, Dyeing, and Printing.”)

[Printed, 1s. 10d. See Repertory of Arts, vol. 8 (*enlarged series*), p. 374.]

A.D. 1846, March 18th.—N° 11,135.

HANCOCK, THOMAS.—“ Improvements in the manufacturing and treating of articles made of caoutchouc, either alone or in combination with other substances, and in the means used or employed in their manufacture;” and these are, first, “ making, forming, or shaping articles from the combination of caoutchouc with other substances, in or upon moulds, plates, or forms, and retaining such articles in or upon such moulds or forms during the process of vulcanizing, whereby the form of such articles is rendered permanent.”

Second, “ the making, forming, or shaping articles of caoutchouc, in or upon engraved or otherwise ornamented plates or moulds, and, after forcing the caoutchouc into such moulds by pressure and heat, submitting the whole, by means of a water or steam bath, or any other suitable mode, to a high temperature, whereby the articles are sufficiently set to be removable from the moulds, and which may be afterwards, if desired, subjected to the vulcanizing process.”

Third, “ the manufacturing articles by combining caoutchouc with vegetable pitch, resin, wood, and cork dust, and fibrous substances, and subjecting them to the process of vulcanizing.”

In all the compounds, and most of the articles named, sulphur and heat are employed, which process is now termed vulcanizing, described in N° 9952. To prevent adhesion to the mould, silicate of magnesia is employed, dusting it on, or otherwise.

[Printed, 4d. See Repertory of Arts, vol. 10 (*enlarged series*), p. 28; and Mechanics' Magazine, vol. 46, p. 400.]

A.D. 1846, March 25.—N° 11,139.

ROBINSON, CHARLES ROBERT.—“ Certain improvements in machinery for tiering in the printing of calicoes and other fabrics;” these are, first, the mode of combining machinery, whereby a brush and doctor are made to move over a sieve surface and tier color thereon whenever the printer may desire it.”

Second, the mode of combining machinery "whereby a sieve surface is made to move to and fro so as to have color tiered thereon whenever the printer may desire it." "In both cases dispensing with the use of children to tier the color." In the above invention described (see "Abridgments of Specifications upon Bleaching, Dyeing, and Printing"), springs of vulcanized india rubber may be attached to the carrying parts of the machines, so as to return them to their position on withdrawing the force which displaced them.

(See "Abridgments of Specifications upon Bleaching, Dyeing, and Printing.")

[Printed, 1s. 8d.]

A.D. 1846, March 25.—N<sup>o</sup> 11,147.

PARKES, ALEXANDER.—"Improvements in the preparation of certain vegetable and animal substances, and in certain combinations of the same substances alone, or with other substances;" and these are, the mode of obtaining "the change upon caoutchouc, gutta percha, and their compounds, by employing agents in a state of solution capable of producing such change." Chloride or hypochloride of sulphur is dissolved in certain quantities in bisulphuret or sulphuret of carbon, coal naphtha, or turpentine, &c., and the articles immersed in the same for a few minutes, the change is produced. Mixtures of other matters with the "solvents may be employed to effect the change, such as the chlorides, nitrites, nitrates, fluorides, bromides, iodides, sulphurets, phosphurets of the earths and metals, preferring those of sulphur, of antimony, of arsenic, and carbon." Caoutchouc in a dry state, if kneaded with a certain amount of dry chloride of sulphur; the change gradually takes place, and while the mass is hot it is pressed into moulds, &c.

A new solvent for caoutchouc, gutta percha, &c. is prepared by passing sulphurous acid gas over granulated camphor, until a liquid is produced; this is used alone, or with the substances which produce "the change," for dissolving caoutchouc, &c.

Caoutchouc and its compounds may be submitted to gases. The gases are, "sulphurous acid, chlorine, nitrous acid, fluorine or the vapours of bromine or iodine." These gases, employed in some cases alone, in others, two together, are passed into a chamber, in which the article is suspended in a vapour of a solvent for caoutchouc, &c.

98 INDIA RUBBER AND GUTTA PERCHA :

Caoutchouc and its compounds, previously to producing the change, are combined with wool, flax, cotton, &c., also wood and cork dust, earths, and oxides of metals, and metallic bronzes ;" also resins and resinous gums, also "cowree gum," or "cowtree gum," and "wood tree gum," from Van Diemen's Land. These articles are ornamented by painting and printing, by means of engraved rollers or otherwise, any pattern or device, first giving them a coloured ground, by certain salts, or by mixing the compounds with colours, after which they are changed.

Caoutchouc and gutta percha, and compounds of these substances, which have undergone "the change," cannot be wrought advantageously by any of the usual means, being very partially soluble in the usual solvents for india rubber, and may be considered as waste ; to recover this waste, it is boiled in a solution of muriate of lime in certain proportions, until by pressure the pieces can be readily united, when it is washed in alkaline water, hot, and afterwards in clean hot water.

Purifying gutta percha by dissolving it in turpentine, naphtha, &c., keeping the solution at a temperature of 100° to 150° F. for an hour or more ; on the colouring matter, &c. subsiding, the solution is decanted and the solvent evaporated, "and the purified 'gutta percha may have 'the change,' produced thereto."

By a Disclaimer, enrolled 25th September 1846, the patentee states that since obtaining his Letters Patent "he has not had 'time to mature that part of the invention which was intended 'to have been described under that part of the title which is 'contained in the following words, 'and animal.'"

[Printed, 5d. See Repertory of Arts, vol. 9 (*enlarged series*), p. 46 ; Mechanics' Magazine, vol. 45, p. 400 ; and Patent Journal, vol. 1, p. 342.]

A.D. 1846, May 15.—N° 11,208.

HANCOCK, CHARLES.—"Certain improvements in the manufacture of gutta percha, and its applications alone and in combination with other substances ;" and these are, first, "preparing gutta percha for manufacturing purposes ;" this consists in taking gutta percha as imported, and which is said to be acid, and to have a fœtid or unpleasant smell, and cutting it into small pieces, and steeping it "in an alkaline solution, or in a solution of chloride of some alkali or earth," where it is to remain until the acid or fœtid impurities are removed. Common soda or potash are preferred for forming the solution,

which is to be of a given strength. "If it is desired further to diminish the acidity or smell of the gutta percha it may be first subjected to an alkaline solution, and then to a solution of chloride of lime." "Gutta percha thus prepared may then be subjected to the process" given in N° 10,550.

Second, giving "shape and configuration to articles to be made of gutta percha, or any of its compounds, by casting, moulding, pressing, stamping, and otherwise," as described. "The compounds of gutta percha most applicable for this purpose are produced by mixing gutta percha with caoutchouc and jintawan, or either of them, and thoroughly blending the several materials in the manner described" in the Specification of Patent N° 11,032, "or by adding to the mixtures or compounds bronze or other metallic powders, plaster of Paris, or other earthy powders, pigments, fibrous materials cut up short, paper pulp, or dust, &c." The shape is given "by means of moulds, patterns, or dies, &c., which may be of metal, glass, wood, or earthenware," to the gutta percha and compounds in a plastic state; or solutions of gutta percha, &c., may be applied to the moulds, &c., and several layers may be dried upon such moulds, &c. In forming articles of several sheets, the "sutures or joints may be" joined by heat and pressure or solutions of gutta percha &c., that in bisulphuret of carbon is preferred, or in the plastic state. "Excellent moulds, &c. may be made of gutta percha," &c., and applied to "give form or shapes, &c." "to articles to be made of gutta percha," &c., "or of such other substances as can be moulded at a low temperature." "Although pieces of gutta percha, &c., in a warm and soft or plastic state unite together, yet a piece of gutta percha, &c., will not adhere to any other piece of gutta percha, &c. which is in a cold and rigid state." "Forms of types, woodcuts, printers' blocks, &c. to be used in printing, are made by placing the pattern in a shallow box or frame clamped together, and a sufficient thickness of gutta percha, &c. is pressed by a screw or other means upon it," &c. "Blacklead or French chalk may be used as a facing, to secure a perfect delivery from the mould." Articles may be imbedded in any manufacture of gutta percha, &c. during its manufacture, "such as handles, knobs, screws, hinges," &c., and in any mould, &c., such as "doors, framings, pannels, or other parts of the bodies of railway or other carriages." "Articles may be made of gutta, &c., formed

## 100 INDIA RUBBER AND GUTTA PERCHA :

" upon skeleton or other shapes or foundations made of iron, wood, &c., as saddle trees, axles, or shafts of rollers, &c." Perforated metal, wire gauze, or cloth may be employed for manufacturing skeleton forms of many articles. These are covered by solutions, and by pressing in the plastic material, &c.

Third, "impressing letters, characters, and figures upon sheets." The gutta percha or its compounds, mixed with French chalk, &c., according to N° 10,550, and made into sheets, are passed through the printing press without inking the type, or figured copper, or steel plates, blocks, rollers, dies, stamps, &c., are passed over or pressed upon sheets of gutta percha, &c., or sheets are "punched" or cut through and through and cemented upon other sheets "or upon blocks of gutta percha." "The different sheets or blocks may be made of various colours." A striking result is produced by spreading gutta percha, &c., on cloth, paper, &c., or on sheets of gutta percha, &c., of a colour as opposite as may be to the gutta percha, &c., spread upon it, and printing, &c. upon this with dry type, &c. Sheets spread with gutta percha, &c. may be drawn upon by the hand with a dry style, &c.

Fourth, varnishing or producing "a smooth surface on sheets of gutta percha or any of its compounds." This is effected by first coating with a thin solution of gutta percha, &c. or turpentine, and afterwards with a varnish, described in N° 11,032.

Fifth, "veneering and inlaying sheets of gutta percha or any of its compounds and other substances." The surfaces to be veneered are laid flat, and pieces of gutta percha, &c. softened and coloured, or otherwise, and of the shape required, are placed and pressed upon them; or, the surfaces which come in contact "will be more effectually united by previously giving one of them a thin coat of similar material, or a coat of turpentine, or some other solvent." Veneers may be made and employed of thin metal, wood, &c. with their surfaces roughened and coated with a solution of gutta percha, &c. Wood, metal, papier mâché, pasteboard, &c. are covered with veneers, &c. of gutta percha, &c., coloured or otherwise, "the adhesion of the sheets being caused by means of a coat of solution."

Sixth, "making of paper and pasteboard with gutta percha combined with other materials, and also covering paper with gutta percha in solution or powder." This is effected by mixing gutta percha with the pulp or paper dust in a dry state, or otherwise rolling and pressing the mixture into sheets; suitable

pigments may be added of a colour as required. Paper may be coated by immersing it in solutions of gutta percha, and passing it between rollers.

Seventh, "employing bisulphuret of carbon, solutions of gutta percha and its compounds, in combination with other substances."

Eighth, combining, "stitching, and cementing" in producing "various articles." The joinings are stitched, and then done over with a solution of gutta percha, or covered "with strips of gutta percha."

[Printed, 6d. See Mechanics' Magazine, vol. 46, pp. 230 and 295; and Patent Journal, vol 2, p. 447.]

A.D. 1846, May 15.—N° 11,209.

BARTLETT, HENRY VALENTINE.—"Improvements in artificial palates, teeth, and gums, and certain machinery employed in the manufacture thereof;" and these are, manufacturing these articles "made of hippopotamus or other ivory, and the fitting-in of teeth into artificial palates and gums, without pins, rivets, springs, or ligatures." "A cast of the mouth, or part of the mouth, which is to be fitted with the artificial substitute, is taken in softened bees'-wax." From this "a reverse impression is taken in plaster of Paris, and from that reverse impression or mould" one is taken "in some plastic material which softens and hardens readily, such as shellac or gutta percha." This serves as a model from which to carve, by a machine described, an ivory substitute.

[Printed, 1s. 3d. See Patent Journal, vol. 2, p. 444.]

A.D. 1846, May 19.—N° 11,212.

PERRY, STEPHEN.—"Certain improvements in the manufacture of rings, straps, bands, and bandages, cords and strings, and in their application to clockwork, to locks and other fastenings, to presses, to books, to paper-holders, to candle lamps, to window sashes, to doors, to window blinds, to seats and surfaces for lying and reclining upon;" and these are applying to the above purposes caoutchouc prepared according to the processes described by Mr. Alexander Parkes.

[Printed, 2s. 4d.]

A.D. 1846, May 22.—N° 11,217.

WRIGHT, CHARLES.—“ Certain improvements in the manufacture of boots and shoes ;” and these are, first, “ fastening the upper leathers to the soles, and the heels to the soles, and the inner and outer soles together, of boots, &c. by means of plugs.”

Second, “ making the leather, or other materials used in ” the manufacture, by applying an improved waterproof material.

Third, “ ventilating boots and shoes by the introduction of an air passage through the heel, similar in some respects to what is called the spur box.”

The waterproof materials described in the second part of this invention are two, one consisting of india rubber, coal tar, linseed oil, gold size, litharge ground in oil, “ ground ammonia,” and vegetable black; these are mixed in certain proportions and in a certain manner; the other consists of india rubber dissolved in boiled linseed oil, litharge ground in oil, and vegetable or other black, in certain proportions.

Two or three coats of either of these mixtures are put on to the leather.

[Printed, 6d. See London Journal (*Newton's*), vol. 30 (*conjoined series*), p. 407; and Patent Journal, vol. 2, p. 446.]

A.D. 1846, June 29.—N° 11,271.

TATHAM, JOHN, CHEETHAM, DAVID, and DUNCAN, JOHN WALLACE.—“ Certain improvements in the machinery or apparatus to be used in the preparation and spinning of cotton and other fibrous substances ;” and these apply, “ first, to the scutcher,” or “ lap machine,” “ which is employed for the purpose of cleansing the cotton or other fibrous material, and lapping it in a compact or even sheet or lap upon a roller, preparatory to its being fed into the carding engine, and consists in a new arrangement of rollers for compressing or calendering the sheet of cotton or other fibrous material previous to its being lapped upon the roller; and also in a new method of weighing the calendering rollers, whereby the pressure is gradually increased as the sheet of cotton or other fibrous material approaches ‘ the lap.’ ”

Second, “ employing or using an apparatus for the purpose of collecting the short fibres of cotton, or other fibrous material,

“ from the dust which is blown by the fan from the ‘scutcher,’  
 “ or ‘lap machine.’ ”

Third, “consists in causing the ‘sliver’ to be twisted as it is  
 “ delivered from the carding engine, or other preparation ma-  
 “ chinery, into the tin can or other receptacle employed.”

Fourth, applying “gutta percha” and “tintowa” for “cover-  
 “ ing rollers used; applying the several machines usually em-  
 “ ployed in preparing and spinning cotton and other fibrous  
 “ substances; these substances may be used either alone, or in  
 “ combination with caoutchouc, sulphur, sulphurets, chloride of  
 “ sulphur, gum, resins, leather, fibrous materials, cork dust, French  
 “ chalk, oxides of metals, or other suitable compounds. These  
 “ roller covers, formed of ‘gutta percha’ and its suitable com-  
 “ binations, may be put upon the rollers in the manner usually  
 “ practised in covering such rollers with leather, which is well  
 “ known; and the ‘gutta percha’ alone, or in combination with  
 “ other substances, may be applied in a state of solution, also in  
 “ the plastic state, granular state, sheet state, thread state, or a  
 “ strip state, to rollers forming covers, or above or over caout-  
 “ chouc, or any combination of caoutchouc, cloth, cotton, leather,  
 “ or other material or substance, upon the rollers, thus forming an  
 “ exterior coating or covering.”

Fifth, relates to the “flyer” now usually employed in that  
 description of preparation machinery commonly called “presser  
 “ frames.”

[Printed, 1s. 4d. See London Journal (*Newton's*), vol. 31 (*conjoined series*),  
 p. 77.]

A.D. 1846, July 13.—N° 11,287.

MIDDLEMORE, WILLIAM. — “A certain improvement in  
 “ saddles;” consisting, first, of “a method or methods of  
 “ applying strips or straps and sheets or continuous layers of  
 “ india rubber,” “either in the ordinary state or when vulcanized,  
 “ in the construction of the support or foundation of the seats of  
 “ saddles; also the use of a stratum or layer of the said india  
 “ rubber, immediately under or over, or immediately under and  
 “ over the stuffing of saddles, whether” the “strips or straps  
 “ and continuous stratum or layer be used conjointly or sepa-  
 “ rately;” second, “applying caoutchouc or india rubber in the  
 “ construction” of the heads “of ladies’ saddles.” Gutta



104 INDIA RUBBER AND GUTTA PERCHA:

percha, either in its ordinary state or prepared, may be employed instead of caoutchouc.

[Printed, 8d. See Patent Journal, vol. 2, p. 577.]

A.D. 1846, August 29.—N° 11,356.

HOLDSWORTH, ARTHUR HOWE.—“Improvements in buoys, “and in giving buoyancy to buoys;” and these are, applying tubes, vessels, or hollow apparatus, capable of retaining air, and made of vulcanized india rubber. In giving buoyancy to boats, tubes are placed across the boat, or otherwise, under the thwarts, and even with the thwarts apertures are opened in the sides of the boat; each aperture is provided with “a valve or door, so hung “that it will open outwards, and that, when closed, water cannot “flow into the boat through it.”

[Printed, 6d. See Repertory of Arts, vol. 9 (*enlarged series*), p. 215; London Journal (*Newton's*), vol. 30 (*conjoined series*), p. 169; Patent Journal, vol. 2, p. 672; Engineers and Architects' Journal, vol. 10, p. 145.]

A.D. 1846, October 8.—N° 11,402.

NALDER, FRANCIS.—“Improvements in the manufacture of “gloves;” and these are, first, “applying india rubber, rendered “permanently elastic, to the wrists of gloves.” Second, “manu- “turing woven or braided bands, suitable to be used for the tops “or wrists of gloves.” The india rubber permanently elastic is vulcanized india rubber, and it is preferred to use “a ring or rings “of such material, by sewing or cementing it or them to the “wrists.” In manufacturing woven or braided bands, it is suggested that when such fabric is being woven, whether in the shuttle, loom, or warp machine, or in the knitting frame, &c., to introduce strips of the permanently elastic india rubber into it. The strands of vulcanized india rubber, covered, are to be used as the warp, or part of the warp. The india-rubber strands are stretched while they are being covered. Strands of vulcanized india rubber are introduced into braids in the same manner as strands of ordinary india rubber, only they must be kept stretched, and this is effected by causing the thread, as it passes from the bobbin in its unstretched state, to pass round rollers going at different speeds, before being woven.

[Printed, 4d. See Repertory of Arts, vol. 9 (*enlarged series*), p. 287; and Patent Journal, vol. 2, p. 771.]

A.D. 1846, October 22.—N° 11,426.

HALE, JAMES LYSANDER.—“ Certain improvements in sewerage “ and drainage, and apparatus connected therewith, parts of “ which are applicable to steam engines;” and these are, first, “ to prevent the escape of foul or noxious air, gases, steam, and “ vapours from drains, engines, pipes,” &c. “ Second, to obviate “ the effect arising from corrosion of iron, and metallic sub- “ stances of which valves and their hinges and beds are com- “ posed, and to promote and facilitate their more free and perfect “ action.” Instead of the pipe part of a sewer trap being made of iron, a stoneware or glass, &c. pipe is employed; and instead of the flap or valve part of a sewer trap being made of iron, and attached to the pipe by metal hinges, a flap or valve is made of india rubber vulcanized, gutta percha, &c., with a hinge to attach it to the pipe of vulcanized india rubber, gutta percha, &c. The hinge is secured, by preference, by means of “ a certain well- “ known adhesive solution, manufactured by the Kampticlican “ Company.” Other arrangements are made, by which india rubber is employed, instead of metal, in drainage and sewerage. The valves described are applicable to steam engines, “ and are “ used in precisely the same way as valves already in use.”

[Printed, 7d. See London Journal (*Newton's*), vol. 30 (*conjoined series*), p. 276; Patent Journal, vol. 2, p. 840; and Engineers' and Architects' Journal, vol. 10, p. 181.]

A.D. 1846, November 4.—N° 11,436.

NEWTON, ALFRED VINCENT (*a communication*).—“ Certain “ improvements in the manufacture of driving bands, part of “ which improvements are also applicable to the manufacture of “ other fabrics;” and these are, manufacturing “ flat bands “ (applicable to the driving of machinery, the raising of weights “ from mines, and other similar purposes,) by employing certain “ mechanical means, and rendering “ such bands and other “ fabrics waterproof.” It is stated that hitherto these bands have been manufactured by sewing the strands together by hand, and now it is proposed that they should be woven in a loom to form a strong narrow fabric.

In order to render the flat bands impervious to water, they are treated with a mixture of the following substances, in certain proportions:—Linseed oil, litharge, terra umbra or lamp black or soot, ceruse, plaster. “ This may also be applied to the water-

106 INDIA RUBBER AND GUTTA PERCHA:

“ proofing of other coarse fabrics, such as tarpaulings.” In applying the waterproofing, rollers are employed.

[Printed, 9d. See Patent Journal, vol. 2, p. 864.]

A.D. 1846, November 19.—N<sup>o</sup> 11,455.

BROCKEDON, WILLIAM, and HANCOCK, THOMAS.—“Im-  
“ prove ments in the manufacture of articles where india rubber  
“ or gutta percha is used;” and these are the peculiar means  
of applying india rubber or gutta percha to a variety of pur-  
poses to which they have not heretofore been so applied by  
means of the processes described in the Specification of a Patent  
granted to Mr. Alexander Parkes, N<sup>o</sup> 11,147. “The processes  
“ enumerated in this Patent produce certain changes in the qualities  
“ of caoutchouc and gutta percha, similar to those produced by  
“ sulphur and heat in the process now termed vulcanizing.”

“ In calling those substances by the names of caoutchouc and  
“ gutta percha, it is to be understood that they ” “ comprehend  
“ all those peculiar hydrocarbon substances known to botanists as  
“ a vegetable constituent under those names.” “ Some of these  
“ are named from the country they are obtained, some are native  
“ names, as saikwah, juitawan, gutta tuban, gutta percha, dolla,  
“ &c.” These substances, under whatever name they may be  
called, are all liquified by the same solvents; by distilling give  
caoutchoucine and manipulate in the same way by rollers, mas-  
ticating, spreading, cutting, &c., colouring, embossing, printing,  
moulding, &c. &c., as is well known, and has been described in  
the Specifications of other Patents. Amongst others is those  
of Mr. Thomas Hancock, N<sup>os</sup> 7344, 7549, 9952, 11,135, as well  
as in the first-named Patent of Mr. Parke’s. “Leather, cloth,  
“ linen, silk, and other fabrics are rendered partially or entirely  
“ waterproof by coating their surfaces, or uniting two or more of  
“ them together with caoutchouc, gutta percha, or a compound  
“ of these matters in a state of solution or otherwise, as described  
“ in the Patents of Thomas Hancock ” referred to; and “the  
“ coated surfaces either plain, colored, embossed, printed, or  
“ otherwise ornamented, are then ” changed “by immersion ” in  
Mr. Parke’s solution. Printed or dyed fabrics, coated on one side  
only, the selvages and ends are joined and made waterproof, and  
in this bag-like shape immersed in the liquid. Fibrous and other  
substances liable to be injured by the changing solvents are

coated with glue size, which is afterwards removed by water; when lac is used, it is removed by any suitable alkaline solution.

In this way the effect of the changing liquid is stopped out "in any part of an article formed of caoutchouc, gutta percha, or "a compound thereof." These manufactures are introduced into a great variety of articles such as cloaks, capes, coats, overalls, fishing stockings, collars, stocks, hats, caps, bonnets, hat linings, hatbands, aprons, and other articles of dress or to be worn about the person; also table cloths, wrappers, carriage roofs, seats, and linings, portable baths, diving dresses, life preservers, beds, cushions, pads, and other pneumatic articles, printers' blankets, sieve cloths, card backs, &c., &c., &c.

When these articles require seams, &c. the waterproof substance employed to such parts will require to be afterwards changed by applying the converting solvent with a brush, &c. Garments, or other article of dress, either of leather, cloth, &c. are made up and dipped or otherwise covered with a solution of caoutchouc, &c., and afterwards immersed to obtain the change. An interior lining is changed by pouring in the changing liquid. Caoutchouc, gutta percha, or a compound thereof, with or without gritty or colouring matters and fibrous substances, is formed into sheets of any thickness, by means similar to those in Thomas Hancock's Specifications, and these are made up into articles or not before the "change" is effected. From these sheets, whether combined with fabrics and fibrous and other substances or not, a great number of articles are made. These are enumerated at great length, and a great number of applications are detailed. Caoutchouc, gutta percha, and the compounds thereof are moulded into various forms, engraved by plates, &c., &c. as described in Thomas Hancock's Specification, and afterwards immersed. Gutta percha, and compounds thereof, are made into numerous articles by the means directed in Nos 7344, 7549, and changed by immersion. Sometimes these articles are coated with a solution, of caoutchouc before submitting them to the change. A great number of articles made of cloth, paper, metal, cast plaister, cord, string, are dipped in the solutions of caoutchouc, &c. and dried, are immersed to produce "the change."

Woollen or worsted yarn, of a size proportionate to the strength of the required hose or tubing, is saturated with a solution of the compound, and when dry it is braided upon a core and pressed with heat, and changed by immersion. A flock is produced by

108 INDIA RUBBER AND GUTTA PERCHA :

giving the article to be flocked a coating of caoutchouc varnish, dusting on the flock or powder, and when dry immersing it in the changing liquid. Articles are coated with coloured caoutchouc varnishes, and changed by immersion. By repeated immersion and drying, the compounds "become as hard or harder than ivory, and may be filed and wrought with tools and highly polished."

[Printed, 5d. 'See Repository of Arts, vol. 10 (*enlarged series*), p. 103; Mechanics Magazine, vol. 46, p. 504.]

A.D. 1846, December 15.—N° 11,495.

BINGLEY, MARK.—"Improvements in bookbinding, and in "weaving materials used in bookbinding; applicable also to "other weavings, and in preparing for and making alphabets for "accounts and other books, and in inking type therefor, and "other purposes, and in preparing sprinkled, granulated, or "mottled paper for bookbinders and others; applicable also to "the edges of books, and in graining or checquering Russia and "other leather." In weaving materials in carrying out part of this invention, it is stated, that it is "very advantageous to use "shuttles with springs applied of india rubber vulcanized," in order to obtain the requisite pressure to the weft in shuttles for weaving; and, the making by weaving headbands, and applying vulcanized india rubber to produce the above effect, are claimed. 'This is effected as follows:—One end of the bow, pressing on the bobbin attached to the shuttle, passes through a piece of vulcanized india rubber, fastened in such a manner to a wire in the body of the shuttle, so that when the wire is turned in one direction or the other the piece of india rubber will be distended or allowed to collapse, thus increasing or diminishing the strain on the lever, and consequently on the bobbin "to prevent its unwinding too "freely."

[Printed, 2s. 8d.]

A.D. 1846, December 23.—N° 11,509.

GOUGY, PIERRE FREDERICK.—"Improvements in apparatus "and machinery for raising, lifting, and otherwise moving heavy "bodies;" and these are principally connected with the raising of ships, vessels, &c., sunken in water. And in doing so part of the arrangements require "a set of bags formed of some hempen

“ or cotton fabric rendered waterproof by caoutchouc or gutta “ percha.” These, in a collapsed state, are sunk attached to a frame, and afterwards filled with air by an arrangement of pipes assist in raising the vessel, &c.

[Printed, 1s. 11d. See *Mechanics' Magazine*, vol. 50, p. 505; and *Patent Journal*, vol. 3, p. 129.]

A.D. 1846, December 31.—N° 11,513.

DOWSE, CHARLES. —“ Improvements in applying springs to “ braces, to portfolios, to hats and caps, and memorandum “ books ;” and these are, first, “ the modes of applying springs to “ braces ;” and this is principally fastening a strong ring or rings at the backs of braces. The ring or rings are “ of what is called “ vulcanized or converted india rubber.” Second, “ the mode of “ applying springs to the straps of hats and caps,” and “ consists “ of applying a ring or rings of permanently elastic india rubber “ to the straps used for keeping a hat or cap on the head.” Third, “ the mode of attaching springs to portfolios and memo- “ randum and other books,” by applying spring rings of per- manently elastic rubber “ affixing them to the backs of portfolios “ or memorandum books in any convenient manner.”

[Printed, 1s. 2d. See *Repertory of Arts*, vol. 10 (*enlarged series*), p. 80; and *Patent Journal*, vol. 3, p. 177.]

A.D. 1847, January 28.—N° 11,549.

LUTEL, ELIZABETH OUDINOT (*a communication from Césaire Luc Louis Oudinot*). —“ Producing a certain texture elastic in some “ parts.” This texture is a double one, and is obtained by “ em- “ ploying a double warp placed over and passed through a double “ harness, properly provided with supplementary stitching treadles. “ By that operation the two tissues are united together when “ required.” The elasticity is obtained by introducing, “ among “ the non-elastic threads of the warp, a certain number of elastic “ threads prepared by the usual mode, too well known to require “ any description,” or in the weft, by weaving “ a certain extent “ of the tissue with non-elastic threads, and continue after, by “ means of the shuttle, to produce another with elastic threads.” No mention is made of the composition of the elastic threads.

[Printed, 3d. See *London Journal (Newton's)*, vol. 35 (*conjoined series*), p. 397.]

A.D. 1847, February 1.—N° 11,554.

DAFT, THOMAS BARNABAS.—“Improvements in constructing “inkstands, and in fastenings to elastic bands,” and these are first, “the mode of making elastic inkholders and dipping cups, “and combining therewith apparatus for receiving and com-  
“pressing the same.” The inkholders are made of india rubber, by cementing the parts together, when they are “vulcanized.” The inkholder has a dipping cup above it, and by pressing the inkholder, the ink rises into and remains in the dipping cup until the inkholder is allowed to expand to its elasticity, which it does, if a certain nut be drawn or turned back.

Second, “making fastenings for elastic bands.” It is stated that “it is difficult to attach any instruments for fastening elastic “bands made of vulcanized or converted india rubber, owing to “ordinary cements not attaching themselves to such preparations “of india rubber:” and to obviate this “two parts of an elastic “band have attached thereto two eyes of metal.” “The ends of “the elastic bands are passed through the eyes, and folded “down,” and then bent plates of metal are placed and pressed so as to bind the parts; a double hook hooks into the eyes of each of the straps, “and thus there is a secure fastening pro-  
“duced.” Or the ends of two india rubber bands are turned over and cemented, leaving an eye opening through; they are then vulcanized, and “a staple put through the eyes” at the end of the hands, will secure them together.

[Printed, 11d. See Repertory of Arts, vol. 10 (*enlarged series*), p. 146; and Patent Journal, vol. 3, p. 262.]

A.D. 1847, February 8.—N° 11,567.

MOULTON, STEPHEN.—“Improvements in treating caoutchouc “with other materials to produce elastic and impermeable com-  
“pounds;” and these are, “treating caoutchouc, by combining “therewith calcined and carbonate of magnesia, and hyposulphite “of lead, and the artificial sulphuret of lead, and subjecting it “to high degrees of temperature.” If the goods “are intended “to be elastic, the caoutchouc is mixed” with variable quantities “of hyposulphite of lead, and the artificial sulphuret of lead, “both or either.” If the goods “are intended to be hard, of “greater tenacity, and less elasticity,” the caoutchouc is mixed with variable quantities of “calcined or carbonate of magnesia,”

"and then add both the hypo-sulphite and sulphuret of lead, or "either." These mixtures are made by passing the materials through sets of heated rollers, and they are spread upon cloth by means of three heated rollers. "The compound is placed between "the upper rollers, and passes to the lower one, on which the "cloth for its reception passes round, and thus receives on its "surface the different coatings of the compound." If sheets of rubber are required, the cloth is dispensed with, "and the sheet "taken from the lower roller." The goods are then heated by steam or dry heat, the former preferred of from 220° to 280°, or 300°. "Some heats may require three hours, and some five "hours, or thereabouts."

[Printed, 3d. See Repertory of Arts, vol 10 (*enlarged series*), p. 178; London Journal (*Newton's*), vol. 31 (*conjoined series*), p. 123; Engineers and Architects' Journal, vol. 10, p. 320.)

A.D. 1847, February 10.—N° 11,575.

HANCOCK CHARLES.—"Certain improvements in the preparation of gutta percha, and in the application thereof, alone and "in combination with other materials, to manufacturing purposes, "which improvements are also applicable to other substances;" and these are, first, preparing "gutta percha for manufacturing purposes, by means of the machines or machinery represented," "that is to say," "as regards the peculiar adaptation and order "of sequence of the parts," and "the general arrangement and "combination thereof," without claiming any of the parts singly and separately considered. The machinery may be described as follows:—A slicing machine, consisting of a circular iron plate having three slots, in which are inserted three radial knives; this plate is made to revolve, and "the lumps of crude gutta percha" fall down an inclined shoot against the knives, "by which they "are cut into slices of a thickness corresponding to the degree "of projection given to the knives." A vertical cutter with a rising and falling motion may be employed, instead of a revolving one as described. The slices are collected, and put into hot water till they are soft, after which they are fed in by a pair of fluted rollers against a breaker or roller with serrated blades inserted in it, revolving over a tank filled with cold water, to which may be added a solution of caustic soda or chloride of lime. At the opposite end of the tank to the roller is an inclined endless web revolving and dipping at its lower end into the water, while at its upper end it comes opposite to feeding rollers of a breaker over



a tank a little lower than the first, also filled with water; and a similar arrangement is made by which the gutta percha is brought into a third tank still lower than the second tank. In this tank, but revolving partly in the water, is a "mincing cylinder," with an arrangement of edge plates "so fixed that the blades of the cylinder shall in revolving come into such close parallelism with them as to produce by their approximate conjunction a scissor-like sort of action." The gutta percha is fed from the tank into this cylinder, &c. by an endless web, and after passing through the mincing cylinder it is agitated by a rotary agitator wholly immersed in the tank, after which it is carried by a revolving endless web through a series of rollers mounted over the after part of the tank, "so that the under rollers revolve under the water and the upper just free of it." From the last pair of these rollers it is taken by an endless web and passed "to a pair of metal pressing and finishing rollers" set to the size required, and passing over the topmost of these rollers and over a wooden drum "it is wound upon a taking-up roller."

Second, "the new combination of materials for sulphuretting or metallo-thionising gutta percha." In Specification of Patent N° 11,208, it is stated "that though a portion of sulphur may be used in place of an equal portion of sulphuret," yet the use of sulphur was considered "altogether objectionable, because of its offensive smell and tendency to efflorescence," but this is not the case, "& a better result is obtained from a combination of the two than from either substance alone," "if a very minute portion of the sulphur be used with the sulphuret." The proportions "best are forty-eight parts gutta percha, six parts of sulphuret of antimony or hydrosulphuret of lime, or some other analogous sulphuret, and one part of sulphur." The compound is boiled under pressure. Caoutchouc and jintawan is treated similarly.

Third, "the several methods of combining sulphur and sulphurets." Instead of mixing these substances in the masticator with the gutta percha, &c., the gutta percha or caoutchouc or jintawan "are submitted to the combined action of steam of a high temperature, and the vapours of orpiment (or other volatile sulphuret) and sulphur mixed in the proportions" given above. Or caoutchouc, &c. are rubbed in a dry state with the combination, and submitted to steam heat, or water heated under pressure; or, after dry rubbing, submitting them to steam at a

high temperature and the vapours of the compound; or a paste is made of the sulphuret and sulphur with a solution of caoutchouc or gutta percha, and brushed over the articles, which are afterwards to be submitted "to one or other of the three processes."

Fourth, "employing binoxide of nitrogen and chloride of zinc, for the purpose of improving the quality of gutta percha." Gutta percha, caoutchouc, and jintawan, sulphuretted or unsulphuretted, may be either exposed for a minute or two to binoxide of nitrogen gas, or by putting them with the materials used in making the gas, or immersing them in a boiling concentrated solution of zinc for a few minutes.

Fifth, applying the "binoxide and chloride above" to the improvement of the ordinary sulphurized or vulcanized caoutchouc.

Sixth, "the new compounds of gutta percha, caoutchouc, and jintawan." These are produced by mixing each of these substances with a certain amount of chloride of zinc. They may be afterwards sulphuretted.

Seventh, "an improved combination of materials for producing spongy or porous gutta percha fit for stuffing or forming the seats of chairs, cushions," &c. &c. The combination consists of gutta percha, caoutchouc, or jintawan, softened with a solvent, mixed with certain amounts of "hydrosulphuret of lime, &c." carbonate of ammonia or carbonate of lime, or other substance that is either volatile or capable of yielding a volatile product, and sulphur;" and this is submitted to a certain heat.

Eighth, "applying the various processes described under the third and fourth heads to the improvement of articles of gutta percha in a manufactured state, after they have been so manufactured."

Ninth, "giving to sulphuretted or metallo-thionized gutta percha a japan like lustre," whether before or after making up for use." "Gutta percha, caoutchouc, or jintawan" sulphuretted in any way, "is brushed over with a solution of resin in boiling oil," and placed in a heated chamber from 75° to 100° F. for some hours; it is afterwards polished. In some instances, colours are mixed with the japanning materials; and these materials are applied "by blocks, cylinders, or rollers, in the usual way of floorcloth printing."

Tenth, "the improved machine or apparatus for cutting gutta

## 114 INDIA RUBBER AND GUTTA PERCHA :

"percha into strips or ribbands, and manufacturing it into threads." This consists of two grooved rollers of steel or iron, mounted in suitable framework. "The grooves of each roller are semicircular, so that when the grooves of one roller are brought opposite to those of the other, they form together a series of circular holes." The projecting divisions between the grooves are made with knife edges, so as to divide readily any sheet or mass of gutta percha which may be presented to them. Thin sheets are cut into ribbands or strips, when the material is passed through it cold. To make round thread, either a sheet of a thickness equal to the diameter of the holes is passed through at a temperature of about 200° F., and received in a tank of cold water, or, the plastic gutta percha is passed towards the machine under a gauge. Other forms of cords are produced by altering the grooves of the rollers.

Eleventh, applying all these "improvements to caoutchouc and jintawan (in so far as such application has not been already claimed)."

[Printed, 1s. 10d. See Repertory of Arts, vol. 10 (*enlarged series*), p. 203; London Journal (*Newton's*), vol. 34 (*conjoined series*), p. 96; and Mechanics' Magazine, vol. 47, p. 157.]

A.D. 1847, April 20.—No 11,669.

WALKER, JOHN.—"Improvements in certain hydraulic and pneumatic machines, and in the application of steam or other powers thereto;" and these are, first, "the peculiar form, combination, and arrangement of hydraulic and pneumatic machines for raising water, or for forcing or exhausting air," "whether they are worked by steam or other power." Second, "the peculiar form, combination, and arrangement of high pressure steam engine" for working these machines. Third, "the peculiar construction and arrangement of valves for hydraulic and pneumatic machines closed by iron or other metal tubes, bedding on cylindrical seatings, or by tubes of gutta percha, or other elastic material," "enclosing metal rods or tubes to give the necessary weight and strength thereto, in lieu of the plugged iron tubes." Fourth, applying "revolving vanes in sets inclined in opposite directions upon a spindle, for raising or forcing water, and also for forcing or exhausting air."

[Printed, 1s. 3d. See Mechanics' Magazine, vol. 49, pp. 53 and 145; Patent Journal, vol. 3, p. 626; and Engineers and Architects' Journal, vol. 10, p. 389.]

A.D. 1847, June 3.—N° 11,729.

NICKELS, CHRISTOPHER.—“Improvements in the manufacture of woven fabrics, and in giving elasticity to certain articles or fabrics;” and these are, first, “weaving duplicated fabrics, consisting of three or more single fabrics, combined or bound together in the act of weaving, shooting the various fabrics with the same or separate weft.” These fabrics, it is stated, “may be very advantageously coated or impregnated with a solution of india rubber,” or of gutta percha, or of both, as other fabrics have been done before; but this impregnation or coating does not form part of the invention. An additional binder warp is to be used over the number of warps used for making the separate fabrics; “and when elasticity is required such binder warps may be of india rubber.”

Second, “weaving tubular or circular fabrics by making them duplicate instead of single.”

Third, manufacturing “duplicate fabrics, with separated selvages, the two, three, or more fabrics being combined longitudinally in the act of weaving;” and it is stated that “india rubber threads or strands may be introduced in any or all such fabrics, in like manner to what has heretofore been done in single fabrics.”

[Printed, 10d. See Repertory of Arts. vol. 11 (*enlarged series*), p. 14; and Patent Journal, vol. 4, p. 56.]

A.D. 1847, July 19.—N° 11,802.

LIGHT, EDWARD.—“Improvements in apparatus for supporting or buoying up persons, boats, and other bodies when in the water;” and these are, “rendering the pieces of rushes, flags, or other similar plants waterproof before enclosing them in cases of the forms or shapes desired.” Whatever be the shape of case to be employed, the rushes, &c. are cut into such lengths as to pack closely together into the form desired, and the ends of each piece are dipped into a waterproof varnish or composition such as has been employed for waterproofing the fabrics of the cases heretofore used, and allowed to dry, and the process is repeated “till the ends are well sealed and closed.” The outsides are then painted with a similar composition, and when dry “then make up the same into cases of such shapes or forms as may

116 INDIA RUBBER AND GUTTA PERCHA:

" be desired, preferring to use waterproof fabrics for the external casing."

[Printed, 3d. See Repertory of Arts, vol. 11 (*enlarged series*), p. 180; London Journal (*Newton's*), vol. 32 (*conjoined series*), p. 119; Mechanics Magazine, vol. 48, p. 284; and Patent Journal, vol. 4, p. 223.]

A.D. 1847, July 20.—N° 11,808.

DAFT, THOMAS BARNABAS.—"Improvements in the manufacture of elastic fabrics and articles;" and these are, "combining the non-elastic fabric and the permanently elastic india rubber by sewing through and through," "in contradistinction to simply holding pieces of india rubber at two ends." A sheet of permanently elastic india rubber is stretched about double its length, and held between clamps or other holders, and on either side of it one or more thicknesses of a fabric or fabrics, such as leather or woven fabric, are placed, and the whole combined into one fabric by rows of stitching through and through the fabrics.

[Printed, 3d. See Repertory of Arts, vol. 11 (*enlarged series*), p. 110; London Journal (*Newton's*), vol. 32 (*conjoined series*), p. 37; and Patent Journal, vol. 4, p. 273.]

A.D. 1847, July 24.—N° 11,814.

PLATT, JOHN, and PALMER, THOMAS.—"Certain improvements in machinery or apparatus for making cards, also for preparing and spinning cotton and other fibrous materials, and for preparing and dressing yarn and weaving the same;" and these are, first, improvements in carding engines, namely, the studs and bosses upon the "bend," and the arrangement of compound brackets for adjusting or setting the rollers nearer to or further from each other, or nearer to or further from the main carding cylinder.

Second, the novel and peculiar adaptation of the common "mule" spindles when used or combined with the "ring and traveller" flyer, and so employed in "throstles" as to spin, form, or produce "pin" or "mule" cops upon the bare spindle.

Third, the novel application, employment, or use of the apparatus above described for doffing or removing the finished cops from the mule spindles simultaneously, instead of removing them by hand, as hitherto done.

Fourth, the peculiar combinations and arrangements of mechanism, as exhibited in the Drawings, for regulating the "letting off" of the warp from the yarn beam.

Fifth, the application, employment, or use of "vulcanized india rubber" to act as springs (in place of the metallic springs and weights now commonly employed) in any or all of the machinery or apparatus for making cards; also for preparing and spinning cotton or other fibrous materials, and for preparing and dressing yarn, and for weaving the same.

[Printed, 1s. 10d. See London Journal (*Newton's*), vol. 34 (*conjoined series*), p. 1.]

A.D. 1847, July 26.—N° 11,815.

DE BERGUE, CHARLES.—"Improvements in buffing and traction apparatus, and in springs for railway and other carriages;" and these are, first, "the mode or modes of constructing and combining apparatus with elastic rings for the purpose of forming buffers or buffing apparatus." The rings are "made of india rubber (or any other elastic substance may be used) rendered permanently elastic by being vulcanized, or by any other process which will produce a similar effect;" between the elastic rings are plates of metal, made with rims on each side at their inner edges for the purpose of keeping every part of the elastic rings at equal distances from the buffer rod, and these are placed within cylinders "so as to cause the plunger to be pressed outward with a moderate degree of force;" other arrangements and modifications of this are given.

Second, "the mode or modes of constructing and combining apparatus with elastic rings, for the purpose of forming traction apparatus."

Third, "the mode or modes of constructing and combining apparatus with elastic rings for the purpose of forming side and bearing springs."

[Printed, 1s. 6d. See Practical Mechanics' Journal, vol. 3, p. 69; Artizan, vol. 5, pp. 87 and 130; vol. 8, pp. 84 and 135; and Patent Journal, vol. 4, pp. 224 and 248.]

A.D. 1847, September 2.—N° 11,850.

FORSTER, THOMAS.—"Improvements in machinery for cutting india rubber, in rendering fabrics waterproof, and in making articles therefrom, and in dissolving india rubber and other gums;" and these are, first, "coating metal cylinders with india rubber or gutta percha, or combinations thereof, for cutting india rubber

## 118 INDIA RUBBER AND GUTTA PERCHA :

“ and its compounds ;” and the means used to regulate the sizes of thread cut, “ in place of having a different screw for each size” of thread. This last is effected by “ using only one screw, which “ is caused to move at different speeds by changing certain of the “ drums according to the size of the thread required.”

Second, “ rendering repellant of water all fabrics coated or “ united with india rubber, or gutta percha, or other flexible gums, “ or combinations of them, by the use of stearine, spermaceti, “ wax, linseed, or other oils, acid soaps, gum or shellac, asphalte, “ tar, or resin.”

Third, manufacturing coloured fabrics, by applying to them coloured compositions of india rubber, gutta percha, or combinations of them. In preference, the combination of india rubber described in the Specification of Patent 10,092 is taken, and dissolved and mixed with the colours required, of which a number are given.

Fourth, “ the use of hydrate of sulphur (milk of sulphur), “ Cornish white, and oxides of tin, as colouring matters.”

Fifth, “ rendering repellent paper and other fabrics with stearine, spermaceti, and wax ;” also, “ finishing paper and “ fabrics which have been coated on one or both sides with india “ rubber, gutta percha, or their combinations, by covering them “ with paints.”

Sixth, using “ alcohol and coal oil combined as solvents for “ gums,” &c., and “ their combination with india rubber and “ gutta percha ;” also “ the use of alcohol when combining india “ rubber with shellac.”

[Printed, 1s. 1d. See Repertory of Arts, vol. 11 (*enlarged series*), p. 209; and Patent Journal, vol. 4, p. 430.]

A.D. 1847, September 24.—N<sup>o</sup> 11,874.

HANCOCK, CHARLES.—“ Improvements in the preparation of “ gutta percha, and in the application thereof, alone, and in combination with other materials, to various manufacturing purposes ;” and these are, first, “ the mode of preparing or treating “ gutta percha alone, and in combination with other materials, by “ means of baths.” For temperatures a little above boiling water, a bath is made of a solution saturated, or nearly so, of some alkaline salt or earth, or any other soluble substance. Carbonates of potash or soda, or muriate of lime, or any salt which will not act prejudicially upon the material, may be employed. For higher temperatures, fixed

oils or fats, &c., are used. If the temperature of the bath is too high, or if the substance of which it is composed would act injuriously upon the gutta percha, &c., the gutta percha, &c., should be enveloped in cloth, plaster of Paris, clay, &c. A bath which will produce a chemical change upon the gutta percha, &c., is sometimes selected, such as of a caustic alkali, or sulphuret of an alkali.

Second, "the method of manufacturing gutta percha, or any of its compounds, into vessels and hollow wares," "by blowing or forcing air or some other fluid into a bag or piece of caoutchouc placed within the material of which any vessel or article is intended to be made, and at the same time (if necessary) subjecting the exterior parts of the material to pressure" of moulds, to give it the form required. In some cases it may be necessary to protect the outside of a piece of gutta percha, &c., this is done "by a covering of caoutchouc."

Third, "combining gutta percha with other materials," in order to harden it and render it more durable, better adapted for bearing friction and resisting the effects of the weather. The gutta percha is boiled for an hour or more in a bath, and mixed in certain proportions with oxides of iron and lead, glue and bituminous matter.

[Printed, *ad.* See *Mechanics' Magazine*, vol. 48, p. 328.]

A.D. 1847, October 7.—N<sup>o</sup> 11,890.

TYRRELL, JOHN.—"Certain improvements in the manufacture of elastic fabrics from vulcanized india rubber, gutta percha, or certain fibrous materials;" and these are said to be, "in the peculiar combination of cam-shaped rings, wheels, rollers, guides, and platines;" whereby the feeding and threading of the needles, the looping of the thread, and the pressing home of the work, are more continuously and regularly effected, and with less friction and labour than is practicable by the original circular loom, originally invented in France, and known there as the "Tricoteur," and patented in this country 14th March 1816, by Mark Isambard Brunel." The looped fabrics manufactured by this machine are preferred to be made "of vulcanized india rubber thread and of gutta percha thread," "such threads in themselves being more or less elastic (independently of the looping), and because also of their waterproof qualities;" yet these improvements "are applicable to the manufacture of elastic fabrics from threads made



120 INDIA RUBBER AND GUTTA PERCHA:

" of fibrous materials, such as silk, cotton, wool, flax, or mixtures  
" of any two or more of such materials."

[Printed, 2s. 6d.]

A.D. 1847, October 14.—N° 11,909.

FISHER, DAVID.—" Certain improvements in the manufacture  
" of boots and shoes;" and these are, first, " certain means of  
" rendering parts of boots and shoes elastic." The elastic used is  
" vulcanized india rubber."

Second, " the mode of making boots or shoes when using  
" cement, whereby the edges of the uppers are perforated for  
" the passage of the cement."

Third, " the modes of making heels of boots and shoes by  
" employing walls or shells of leather, or of metal filled up," and  
" also applying spongy or porous india rubber and gutta percha  
" to the outer surface of the heels of boots and shoes." This last  
is effected " by not quite filling up the shell or wall," " leaving  
" space for receiving a layer " " of a preparation " of india rubber  
" or gutta percha, so formed as to rise above the edges of the wall  
" or shell.

Fourth, making the " soles of boots and shoes, by applying  
" walls or edges of leather, when gutta percha, or a compound  
" thereof, is used for the other part of the sole."

Fifth, " the mode of making soles of boots and shoes, by com-  
" bining strips of leather, gutta percha, or its compound, with  
" flexible cement."

Sixth, " the mode of combining a leather sole to a heel by  
" applying gutta percha for the waist."

Seventh, using " spongy india rubber and gutta percha in the  
" the making of soles of boots and shoes."

Eighth, " the mode of ventilating boots and shoes," " by a  
" conical opening of metal let into the waist of a boot or shoe."

Ninth, " combining slate, coal, pumice, and glass, and also  
" linseed, with gutta percha, in the manufacture of soles and heels  
" of boots."

[Printed, 1s. 6d. See Repertory of Arts, vol. 12 (*enlarged series*), p. 38; and  
Patent Journal, vol. 4, p. 576.]

A.D. 1847, October 21.—N° 11,917.

FORSTER, THOMAS.—" Improvements in combining gutta  
" percha with certain materials, and in the application thereof to

“waterproofing fabrics, and in the moulding of various articles therefrom, in finishing the surface of articles made from gutta percha, or gutta percha combined with other materials, and in “cleansing gutta percha;” and these are, first, combining gutta percha with animal charcoal, ground whalebone, hydrate of sulphur, fragrant essential oils, musk, tonquin beans, orris root, or gum benzoin, and for applying them alone, or in combination with caoutchouc or other matters, to fabrics.

Second, combining gutta percha with ground bones, horns, hoofs, whalebone, or shavings of these matters, or animal charcoal, hydrate of sulphur, with or without perfumes, or colouring matter, and applying the same alone, or in conjunction with fabrics, or veneers of wood, to the manufacture of various articles.

Third, uniting with gutta percha fabrics previously rendered repellents of water, by any of the usual methods.

Fourth, using cones of wood for filling up moulds.

Fifth, finishing the surfaces of fabrics coated with gutta percha, by coating them with transparent colours.

Sixth, cleansing gutta percha by masticating, washing, &c., part of which machinery is described in the Specification of Patent N° 10,092.

[Printed, 7d. See Repertory of Arts, vol. 11 (*enlarged series*), p. 303; *Mechanics' Magazine*, vol. 48, p. 450; and *Patent Journal*, vol. 4, p. 574.]

A.D. 1847, November 2.—N° 11,938.

HANCOCK, THOMAS.—“Improvements in fabrics elasticated “by gutta percha, or any of the varieties of caoutchouc;” and these are, printing the surfaces of elastic fabrics “formed by “cementing to caoutchouc when in an extended state, silk, “cotton, leather, or other covering.” The india rubber of these fabrics may be permanently elastic, or otherwise. The fabrics or articles may be printed by blocks, cylinders, or any suitable apparatus, and “with colors and processes ordinarily used in “printing the various materials of which the exterior of the com- “bined fabric may be formed.” These fabrics or articles are printed either in their contracted or extended state. If printed in the extended state, this is done when the article is stretched to the “extent it would assume when in use.”

[Printed, 3d. See *Mechanics' Magazine*, vol. 48, p. 452.]

A.D. 1847, November 4.—N° 11,940.

WESTHEAD, JOSHUA PROCTER (*a communication*).—“Improvements in the manufacture or treating of india rubber;” and these are, “manufacturing or treating india rubber by subjecting it to dry and moist heat, and sulphurous acid gas, or products of burning sulphur,” and “treating india rubber in waterproof fabrics by subjecting such fabrics to heat, steam, and air.” The goods or articles are put into a chamber, the air of which is brought to 180° Fahrenheit, and sulphurous acid gas admitted and circulated by a fan for about an hour and a half, and the heat of the chamber raised to 220°; steam is then admitted into the chamber, which is now brought to about 280°, and which takes about two hours; “the steam is allowed to flow off; and the process is completed by again causing heated air to flow through the vessel” or chamber, “which dries and hardens the india rubber.”

[Printed, 9d. See Repertory of Arts, vol. 11 (*enlarged series*), p. 345; London Journal (*Newton's*), vol. 32 (*conjoined series*), p. 347; and Patent Journal, vol. 4, p. 600.]

A.D. 1847, November 11.—N° 11,959.

SOWARD, GEORGE JAMES.—“Improvements in suspending window sashes, shutters, and blinds, and in the construction of frames for the same;” and these are, “first, hanging or suspending window sashes, shutters, or blinds, by means of bands or cords of vulcanized india rubber, or other similar elastic materials.”

Second, “hanging or suspending window sashes, shutters, or blinds, by means of bands or cords of vulcanized india rubber or other suitable material, acting in combination with common box springs.”

Third, “hanging or suspending window sashes, shutters, or blinds of the doors and windows of carriages, by means of bands or cords of vulcanized india rubber, or other similar elastic material, or by bands or cords of suitable substances in connexion with box springs.”

[Printed, 9d. See London Journal (*Newton's*), vol. 33 (*conjoined series*), p. 282.]

A.D. 1847, November 25.—N° 11,979.

HUTCHISON, WILLIAM (*a communication*).—“Improvements in treating pasteboard and other substances, rendering them

“ compact and impervious to wet, frost, vermin, and destructive “ agents;” and these are, after drying these substances in a suitable manner, immersing them in a boiling solution composed of certain substances, according to the article to be treated. For pasteboard, &c., resin or pitch and oils, tallow, or any other greasy matter, in certain proportions, with the addition, together or separately, of pounded stone, chalk, slate, &c., thoroughly dried, and then mixed therein as required, will produce the desired effect. Paper, old rags, hemp, flax, jute, tow ropes, and cordage, even hay and straw, either mixed together or not, and formed into a substance, dried and submitted to this solution, will produce a flexible but compact and impervious substance useful for many purposes. For some articles, such as plaster, plaster of Paris, statues, busts, &c. may be treated with pitch or resin and oils, tallow, or fatty matter mixed in certain proportions and colored with vegetable or mineral matter. The proportions of pitch or resin and oils, tallow, or fatty matters, &c. vary with the nature of the substance to be treated. For joints, as in paving, in pipes and other work, either pounded stone or marble, chalk, sand, plaster, clay, &c. are dried and incorporated with resin or pitch and oils in certain proportions. This may be formed into blocks, &c. for different uses.

[Printed, 4d. See London Journal (*Newton's*), vol. 32 (*conjoined series*), p. 283; Patent Journal, vol. 4, p. 455; and Artizan, vol. 8, pp. 86 and 182.]

A.D. 1847, December 30.—N° 12,007.

HANCOCK, THOMAS, and PHILLIPS, REUBEN.—“ Improve-  
“ ments in the treating or manufacture of gutta percha, or any of  
“ the vareties of caoutchouc;” and these consist in dissolving  
gutta percha or any of the varieties of caoutchouc, or reducing  
them to a soft, pulpy or gelatinous state after they have under-  
gone the process of “vulcanization” or “conversion;” also in  
treating unvulcanized solutions or preparations of these sub-  
stances, so as to bring them to a vulcanized state; also in im-  
provements in moulds employed in the manufacture of articles  
from these substances. The terms “vulcanizing” and “con-  
“ verting,” as applied to these matters, are now well known as  
designating certain improvements in the manufacture of caout-  
chouc, whereby it is rendered less liable to be affected by variations  
of temperature; and the improved solutions, when dried, partake  
more or less of the same property. The first-named process is

## 124 INDIA RUBBER AND GUTTA PERCHA:

described in the Specification of a Patent N° 9952, and the second in the Specification of a Patent, granted to Alexander Parkes, N° 11,147. In operating on these substances when in a vulcanized or converted state, take the waste or cuttings of these materials and pass them between rollers, or otherwise reduce them to shreds or sheets, and boil them in oil of turpentine until they are dissolved, keeping the mass well stirred during the operation. Other solvents may be used, such as coal naphtha, and other essential oils; but the necessary temperature in such cases cannot well be attained without employing closed vessels, oil of turpentine is therefore preferred. Instead of operating upon the cuttings or waste vulcanized or converted caoutchouc, take a solution of unvulcanized or unconverted caoutchouc, and mix sulphur with it, in the proportion of from 8 to 12 parts of sulphur to 100 parts of dry caoutchouc, and then submit the mixture to a temperature of about 300°, or from that to the boiling point of oil of turpentine, for a period varying from 15 to 30 minutes, and a somewhat similar result is obtained; or the caoutchouc, the solvent, and the sulphur may be treated in the same manner, without previously dissolving the caoutchouc; but it is preferred to employ the vulcanized or converted waste, the appropriating of which to a useful purpose being the chief object had in view.

These vulcanized solutions are applied to a great variety of purposes, and for coating or saturating leather, cloth, felt, and other fabrics, wood, metal, paper, plaster casts, and other articles to be protected from air and wet, and as cements; also for pouring or pressing into moulds. Colors are mixed with these vulcanized solutions, and they are so used for coating, colouring, printing, &c. Boiled oils, japan, varnishes, gums, resins, pitch, asphalte, metallic oxides, earths, wood, and cork dust, and fibrous and other substances are mixed with these solutions, and the results applied to various purposes. The articles made from materials prepared by these solutions are very numerous.

[Printed, 4d. See *Mechanics' Magazine*, vol. 49, p. 45; and *Patent Journal*, vol. 5, 202.]

A.D. 1848, January 5.—N° 12,012.

JENNINGS, JOSIAH GEORGE. — "Improvements in cocks or taps for drawing off liquids or gases;" and these consist in "the mode of constructing cocks and taps for drawing off liquids and gases, whereby the passages through the barrels are retained

“ direct, and the closing is by flexible linings.” The material preferred for the flexible lining is what is called vulcanized india rubber, as that material is not prejudicially acted on by considerable degrees heat or cold, and it is not liable to be injuriously acted on but by few liquids.” “ However, gutta percha or other fluid-tight flexible material may be used for the flexible linings of barrels of cocks and taps.”

[Printed, 8d. See Repertory of Arts, vol. 12 (*enlarged series*), p. 105; Artizan, vol. 6, p. 248; Patent Journal, vol. 5, p. 232; and Engineers and Architects' Journal, vol. 11, p. 144.]

A.D. 1848, January 5.—N<sup>o</sup> 12,013.

DE BERGUE, CHARLES.—“ Improvements in carriages used on railways;” and these are first, “ the modes of constructing axle-guards and axle-boxes for railway carriages, that the bearing or working surfaces between them shall consist the one of hard wood, the other of metal; also “ constructing axle-guards by combining two wrought-iron bars with a plate of cast iron clipping the two.”

Second, “ the mode of making the conical centres of separating plate (used in the construction of india-rubber springs for carriages) of soft metal cast in a mould.” The soft metal is composed of zinc and lead in certain proportions, “ but other soft metals may be used.”

Third, “ the mode of constructing a buffing apparatus applicable to carriages used on railways, wherein the resisting power of the buffers is effected by a friction break, so combined as to effect an increasing amount of resistance through the range of the stroke, and producing no recoil action.”

[Printed, 1s. 7d. See Repertory of Arts, vol. 12 (*enlarged series*), p. 97; Artizan, vol. 6, p. 226; Patent Journal, vol. 5, p. 169; and Engineers and Architects' Journal, vol. 11, p. 247.]

A.D. 1848, February 8.—N<sup>o</sup> 12,059.

PIGGOTT, WILLIAM PETER. — “ Certain improvements in nautical instruments, and in the manufacture of cases for containing instruments, goods, or merchandize;” and these are, applying “ vulcanized india rubber, gutta percha, or a combination of these two substances, or “ gutta percha combined with other suitable ingredients,” first, “ to the manufacture of nautical instruments; second, “ to the manufacture of cases for containing instruments, goods, or merchandize.”

## 126 INDIA RUBBER AND GUTTA PERCHA :

Telescopes may have the thin metal tube constituting their body covered with a tube of vulcanized india rubber, and "secured" by two brass ferrules or hoops." They may have their body of wood, covered, outside and in, by a solution of gutta percha, and afterwards with a thin sheet of vulcanized india rubber; or the body may be constructed of gutta percha alone, or combined. Object glasses, lenses, &c., have rings of vulcanized india placed so as they press up against them when they are secured, in order to form an air-tight junction. A compass box may be manufactured of gutta percha or of wood, and covered and lined with gutta percha, or lined and covered with vulcanized india rubber. In cases for mathematical instruments, "the principal novelty is forming a dovetailed groove round the upper edge of the box or under side of the lid, or both, and inserting therein a band or strip of vulcanized india rubber." These cases may be lined with gutta percha. Cartouch or cartridge boxes may be made of gutta percha, with a groove as above to receive a strip of vulcanized india rubber. Pianoforte cases may be lined with gutta percha. Packing cases are formed of wood previously coated on one side with gutta percha, or a solution of the same; or the boards may be coated by passing "them through rollers" with a quantity of gutta percha." The object in these manufactures being to secure the matters they contain from damp and sea air.

[Printed, 7d. See Repertory of Arts, vol. 12 (*enlarged series*), p. 320; London Journal (*Newton's*), vol. 33 (*conjoined series*), p. 107; Artizan, vol. 6, p. 273; and Patent Journal, vol. 5, p. 369.]

A.D. 1848, April 12.—N° 12,120.

MASTERS, JOHN.—"Improvements in dress fastenings, and in attaching the same, and in articles made wholly or in part of certain flexible materials or fabrics;" and these consist in employing for these various purposes bands and pieces appropriately formed, and wholly or in part made of "caoutchouc or gutta percha, made permanently elastic by what is called vulcanizing, or otherwise;" or they are made "permanently elastic after they are manufactured, which may be done by processes described in the Specifications of Letters Patent granted to Messieurs Brockton and Hancock, Mr. Joshua Proctor Westhead, and others."

[Printed, 4d. See Repertory of Arts, vol. 13, (*enlarged series*), p. 30; Artizan, vol. 7, p. 82; and Patent Journal, vol. 6, p. 60.]

A.D. 1848, April 27.—N° 12,136.

BARLOW, WILLIAM HENRY, and FORSTER, THOMAS.—“Improvements in electric telegraphs and in apparatus connected therewith;” and these are, first, “the mode of covering wires used for electric telegraphic purposes with gutta percha or a compound containing gutta percha.” The mode of doing this is by narrow sheets or fillets, these pass through heated rollers, and are thereby heated so as to adhere when they come together; the wires are closed in between two fillets. The materials combined with the gutta percha are cowrie or New Zealand gum and flowers or milk of sulphur, “but other matters may be mixed with gutta percha, or it may be used alone.”

Second, “the mode of governing electric telegraph apparatus (worked by step-by-step motions) by currents of electricity, each producing a different effect when separately acting, and also when acting in conjunction.”

Third, “the arrangement of apparatus for indicating the passage of a train or trains, and the time of passing a station.”

[Printed, 2s. 2d. See Repertory of Arts, vol. 13 (*enlarged series*), p. 341; Mechanics' Magazine, vol. 49, p. 497; Artizan, vol. 7, p. 82.]

A.D. 1848, May 11.—N° 12,153.

HANCOCK, CHARLES.—“Certain improved preparations and compounds of gutta percha, and certain improvements in the manufacture of articles and fabrics composed of gutta percha alone, and in combination with other substances;” and these are, first, “making shoes and galoshes of gutta percha combined with other materials, in so far as regards the combination of elastic or flexible foundations, with gutta percha soles and uppers.”

Second, employing “glass moulds to give a polish to the exterior, or parts of the exterior, of shoes and galoshes made in whole or in part of gutta percha.”

Third, employing “metal springs” made from sheets of gutta percha studded with metal “in shoes and galoshes made in whole or in part of gutta percha, in order to give springiness to the same.”

Fourth, “making backs and stocks for brushes in whole or in part of gutta percha.”

Fifth, employing “for painting, printing, or otherwise applying



128 INDIA RUBBER AND GUTTA PERCHA:

" colors to articles and fabrics made in whole or in part of gutta percha, and also to other articles and fabrics of " a " particular compound or vehicle;" this compound is gutta percha and caoutchouc dissolved in turpentine and mixed with gold size, and colours or pigments are ground before mixing with it.

Sixth, employing other " improved preparations and compounds of gutta percha." Gutta percha, previously boiled with muriate of lime, is passed between heated cylinders while rosin is sifted on; or solutions of the two are made and mixed; this is employed "where complete electric insulation is desirable." Gutta percha, shellac, and borax are mixed and compounded. Gutta percha is made into " metal-studded sheets."

[Printed, 9d. See *Mechanics' Magazine*, vol. 49, p. 490; *Artizan*, vol. 7, p. 63; and *Patent Journal*, vol. 6, p. 76.]

A.D. 1848, June 24.—N° 12,191.

WALKER, DEANE SAMUEL.—"Improvements in the manufacture of bands or straps for hats, caps, shoes, and stocks;" and these are, first, applying the "processes of weaving in the production of bands for the making of bodies of hats;" second, "making mourning hat bands of cylinder or tubular-looped fabrics;" third, "applying a thin coating of india rubber to the interior surface of hat bands to obtain a stronger elasticity to the fabrics;" the ends of the bands are joined by sewing and cementing, or covering with tape and cementing "with india rubber or other suitable cement;" fourth, "making mourning hat bands" by flocking them. Sheet india rubber is cut or otherwise into bands, and, covered with suitable cement; has flock sifted over the surface, "and cement the ends."

By a Disclaimer, inrolled 23 December, 1848, the title was amended to "Improvements in the manufacture of hats," the improvements in "straps, caps, shoes, and stocks" not being new.

[Printed, 4d. See *Repertory of Arts*, vol. 13 (*enlarged series*), p. 173; *London Journal (Newton's)*, vol. 33 (*conjoined series*), p. 416; *Mechanics' Magazine*, vol. 49, p. 646; *Artizan*, vol. 7, p. 130; and *Patent Journal*, vol. 6, p. 125.]

A.D. 1848, July 10.—N° 12,206.

LORIMIER, ANTHONY.—"Improvements in combining gutta percha and caoutchouc with other materials;" and these are said to be, first, "the means of cleansing gutta percha preparatory to compoundin g and using the same." And a series of cutter

are shown by which it may be cut into shavings; these shavings are afterwards torn in a machine, by three revolving bars with spikes, (the bottom of this machine, "is made of wire gauze to let the small dust fall through,") and afterwards treated in a "welding trough" or masticator. When the shavings are required very pure, they are boiled "for about ten minutes in water acidulated with oxalic acid."

Second, "combining gutta percha with" the following matters:—"Burned clay, burned flint, broken articles of porcelain, earthenware, and china, marble, Portland, Cornish, and other stones, crushed and sifted; also the oxide of zinc and the oxide of copper, the hydrate of lime and oxalite of lime; also a compound of lime slacked with oxalic acid dissolved in water."

"For making soles for boots and shoes, the great object is to incorporate as much of either of the above matters or mixtures thereof as the gutta percha will take up and retain a flexible and adhesive character; but in cases where the compounds are to be subjected to strain, such as straps and bands, then lesser quantities will be combined with the gutta percha."

Third, "combining caoutchouc" with "oxide of zinc and the oxalite of lime; also the compound produced by slacking lime with oxalic acid and water."

[Printed, 10d. See Repertory of Arts, vol. 13 (*enlarged series*), p. 171; London Journal (*Newton's*), vol. 34 (*conjoined series*), p. 26; Mechanics Magazine, vol. 60, p. 47; Artizan, vol. 7, p. 133; and Patent Journal, vol. 6, p. 146.]

A.D. 1848, July 29.—N° 12,223.

HANCOCK, CHARLES. — "Improvements in apparatus and machinery for giving shape and configuration to plastic substances;" and these are, first, "the apparatus for moulding hollow wares," "as far as regards the base chuck and the shifting moulds or pattern pieces connected therewith." The base chuck has dovetails cut lengthwise in its four faces "for the reception of four mould pieces," "having dovetail fillets to correspond." The moulds or pattern pieces are "flat on their inner faces, and provided with fillets to slide into the dovetailed grooves of the chuck," so that "all that is required when a change of pattern is necessary is to withdraw one set of patterns and substitute another."

Second, "the apparatus for moulding hollow wares," "whether used with or without the parts thereof relating to cooling."

This apparatus consists of a hollow female mould, into which a male mould is made to press. The material to be moulded is put into the hollow mould, and the male mould presses upon it, while an arrangement causes the female mould to rotate, while, at the same time, either hot water or cold water or steam passes up into the interior of the hollow female mould.

Third, "the apparatus for preparing plastic materials, in so far as regards the combination therein, of a vertical presser, with a horizontal bed filled with hot water or steam, whether such table is fixed or moveable."

Fourth, "the apparatus for moulding plastic substances into continuous lengths with supporting cores of wire, cord, and other like tenacious substances, and the several modifications thereof, in so far as regards the combination of a die box and a cylinder with piston, each working or operating in directions at right angles to or more or less tangential to the other."

Fifth, "the modification of the apparatus which forms the subject of the preceding claim, whereby it is adapted to the production of short lengths of plastic materials of any required form with interior supporting cores."

Sixth, "the improved apparatus for forming plastic substances into balls, in so far as respects its application to other substances than metals." This improved apparatus consists of a pair of rollers made to rotate in close contact with one another. In the periphery of each roller a number of semicircular hollows are cut out, corresponding with a similar set of hollows in the periphery of the other roller, "so that when two such hollows are brought together face to face they form an entire circle or sphere." The plastic substance is supplied to the rollers from a feeding table.

[Printed, 1s. 8d. See *Mechanics' Magazine*, vol. 50, p. 116; *Artizan*, vol. 7, p. 154; and *Patent Journal*, vol. 6, p. 176.]

A.D. 1848, August 5.—N<sup>o</sup> 12,229.

MACKENZIE, DUNCAN.—"Certain improvements in Jacquard machinery for figuring fabrics and tissues generally, and apparatus for transmission of designs to said Jacquard machinery, parts of which are applicable to playing musical instruments, and composing printing types, and other like purposes;" and these relate principally to improvements in different parts of the machinery of the Jacquard loom for figuring fabrics and tissues,

and as regards gutta percha, &c., employing an endless band of paper, gutta percha, or other suitable material, on which the pattern has been punctured, when passed round a cylinder attached to the batten; also an endless band of paper, gutta percha, or other suitable material, having the tune punched out therein, to the actuating of Jacquard machinery for the production of sounds in musical instruments, and an endless band of gutta percha, or any of the compounds thereof, having the pattern punched out upon it, for actuating the needles which act on the horizontal needles, and thereby determine which of the warp threads shall be raised and which left stationary.

[Printed, 3s. 6d. See *Mechanics' Magazine*, vol. 50, p. 138; *Artizan*, vol. 7, p. 155; and *Patent Journal*, vol. 6, p. 184.]

A.D. 1848, August 15.—N° 12,241.

TRUMAN, EDWIN THOMAS.—“An improved method or methods of constructing and fixing artificial teeth and gums, and of supplying deficiencies in the mouth;” and these are, first, manufacturing of artificial teeth and gums, and making good the deficiencies of the mouth in connexion therewith, by employing gutta percha, and the coating the surfaces thereof with metal.”

Second, “the application of electro-gilding in the manufacture of artificial teeth and gums, as a coating to soft materials.”

[Printed, 3½d. See *Repertory of Arts*, vol. 13 (*enlarged series*), p. 186; *London Journal (Newton's)*, vol. 34 (*conjoined series*), p. 117; *Mechanics' Magazine*, vol. 50, p. 187; *Artizan*, vol. 7, p. 184; and *Patent Journal*, vol. 6, p. 215.]

A.D. 1848, September 4.—N° 12,262.

RICARDO, JOHN LEWIS.—“Improvements in electric telegraphs, and in apparatus connected therewith;” and these are, first, combining and insulating two or more wires, one from the other and others, and from external matters, when used for electric telegraphs.” And this is effected by “a pair of grooved rollers heated by steam, the projecting edges between the grooves, when the rollers are working, not coming together, so as to separate or cut the fillets,” but which simply act in such manner as to press the two fillets more closely and intimately together at the parts which come between the wires. “There are two more grooved openings than there are wires to be enclosed,

132 INDIA RUBBER AND GUTTA PERCHA :

“ in order to ensure a perfect closing of the edges and selvages.”  
 “ In place of using gutta percha it is preferred to use that  
 “ material combined with gum cowrie, or New Zealand gum and  
 “ flowers, or milk of sulphur.”

Second, “ an improvement in apparatus for suspending wires  
 “ for electric telegraphic purposes ;” and this is in securing in-  
 sulation in “ the suspended wire ” by keeping the centre portion  
 of the apparatus within which the suspending hook is fixed, dry ;  
 by forming round it, and the outer portion of the suspender, a  
 space “ which acts as a throat to prevent the water which falls on  
 “ the outside of the apparatus passing up the interior.”

[Printed, 5d. See Repertory of Arts, vol. 14 (*enlarged series*), p. 1; Lon-  
 don Journal (*Newton's*), vol. 34 (*conjoined series*), p. 159; Mechanics' Ma-  
 gazine, vol. 50, p. 232; Artizan, vol. 7, p. 159; Patent Journal, vol. 6, p. 216;  
 and Engineers' and Architects' Journal, vol. 12, p. 118.]

A.D. 1848, October 19.—Nº 12,292.

SIEVIER, ROBERT WILLIAM.—“ Improvements in the means  
 “ of warping and weaving plain and figured fabrics ;” and these  
 are, first, “ The mode of weighting the bobbins for the warping  
 “ frame.” This is effected by a weighted or pressure lever with  
 an adjustable weight, “ so as to admit of encreasing or dimi-  
 “ nishing the pressure of tension on the yarn or thread according  
 “ to the strength of the latter.”

Second, “ Weaving two or more pieces of narrow goods or  
 “ fabric in one wide piece of cloth, and interweaving therewith,  
 “ at stated and suitable distances, strands, yarns, or strips of  
 “ gutta percha or other similar or suitable material, which, when  
 “ the fabric is completed, may be more thoroughly incorporated  
 “ with the adjacent fibres by means of heat applied in any convenient  
 “ manner, so that when the wide piece of cloth or fabric is cut up  
 “ or divided into separate widths each width of narrow goods  
 “ may have a suitable selvage at each side thereof, the fibres  
 “ having been cemented together by the gutta percha or other  
 “ material employed in its place.”

Third, “ Making artificial selvages by means of gutta percha,  
 “ caoutchouc, or other suitable material, dissolved in some sol-  
 “ vent and applied to the surface of the fabric, and also causing  
 “ a strip, thread, or strand of gutta percha or other material,  
 “ when laid on or in contact with a piece of cloth or fabric, to be

“ incorporated therewith by means of heat, and thereby form an artificial selvage when the fabric is cut into strips.”

[Printed, 1s. 3d. See *Mechanics' Magazine*, vol. 50. p. 404; and *Patent Journal*, vol. 7, p. 61.]

A.D. 1848, October 26.—N° 12,296.

**CLARK, JAMES.**—“ Improvements in the manufacture of boots, shoes, and clogs;” and these are, first, “ manufacturing a clog, galosh, or overshoe with elastic waist, so that it will elongate and may be put on without the necessity of stooping, and so that it shall hold well on the feet without requiring a fastening.” “ The elastic connecting material, coming up the quarters at the same time, keeps them tight.”

Second, “ manufacturing a galosh or clog heel, so that it shall hold on the heel without a fastening, by using “ gutta percha, or leather, or springs ” to press “ on each side of the heel.”

Third, “ the mode of making boots, shoes, galoshes, clogs, or overshoes with gutta-percha stiffenings for the heels and sides of the vamps, rendered waterproof by inserting a thin piece of gutta percha, which is also used in securing the upper to the sole.”

[Printed, 8d. See *London Journal (Newton's)*, vol. 34 (*conjoined series*), p. 333; *Mechanics' Magazine*, vol. 50, p. 426; and *Patent Journal*, vol. 7, p. 37.]

A.D. 1848, November 2.—N° 12,301.

**JACOBS, MEYER.**—“ Certain improvements in the manufacture, stamping, and treatment generally of woven fabrics of all kinds.” These are the compositions, mixtures, or combinations of materials for the coating or moistening the figures or designs cut or carved in the blocks used for printing or stamping the said figures or designs upon the muslin or other light woven fabrics.” “ For the treatment, printing, or stamping the trellis-like fabrics usually denominated lace,” “ for the treatment of woven fabrics of wool or other similar material,” &c., “ for manufacturing the fabric denominated Utrecht cloth.” For coating, &c. figures or designs, a mixture is made of “ ten pounds of a mordant ” obtained from Paris, from all color manufacturers;” “ Searney's patent sweet turpentine, one pound; boiled linseed oil, two pounds; oil of cloves, four ounces; the dryers commonly called patent dryers, one pound, and sufficient color to obtain the shade

## 134 INDIA RUBBER AND GUTTA PERCHA:

"required." "For treating the trellis-like fabrics," &c. a composition as above is employed, only "omit the boiled linseed oil, "and in lieu thereof introduce the same quantity, namely, two "pounds, of white varnish into the mixture." For woollen fabrics, the composition is the same, only "omit therefrom the "boiled linseed oil and white varnish, and in lieu thereof add, "spirit of sal ammoniac, varying in quantity according to the "texture or substance of the woollen fabric to be operated upon." For manufacturing what is "denominated Utrecht cloth," the composition first described is employed as follows:—Add to the compositions a solution of india rubber, coat one side of the cloth with it, then finish it by passing it into a drum with an arrangement of flock or floss.

(See "Abridgments of Specifications upon Bleaching, Dyeing, "and Printing.")

[Printed, 4d. See Patent Journal, vol. 7, p. 71.]

A.D. 1848, November 25.—N° 12,342.

FONTAINEMOREAU, PIERRE ARMAND le Compte de (*a communication*).—"For certain improvements in the process of "and in the apparatus for treating fatty bodies, and in the application of the products thereof to various useful purposes." In treating fatty bodies for various products as described, a number "of refuses" are said to be obtained which "have very often the "elasticity of india rubber," "and combining them with asphaltes "by any of the well-known processes. These refuses, so prepared, can serve as natural bitumen." "These refuses of distillation" are used "for the production of typographical ink, "cloth varnish, gas for lighting; and by subjecting them," alone or "combined in suitable proportions of lime, to a slow distilling operation," an oil is produced "fit for dissolving india rubber "and for lighting."

[Printed, 11d. See London Journal (*Newton's*), vol. 35 (*conjoined series*), p. 240; *Mechanics' Magazine*, vol. 50, p. 525; and Patent Journal, vol. 9, p. 92.]

A.D. 1849, January 11.—N° 12,407.

NICKELS, CHRISTOPHER.—"Improvements in preparing and "manufacturing india rubber (*caoutchouc*);" and these are, first, "constructing the kneading rollers with flanches," and causing the kneading rollers, "with or without flanches" to work out of

the centre of the cylinder or trough." The "machinery is similar to that" described in the Specification of Patent N° 7213, only "the masticating roller has flanches" "by which the india rubber is prevented from coming against the ends of the fixed trough or cylinder." There is also another arrangement of kneading machine, the kneading roller of which "is placed and works excentrically within the trough or cylinder," and it may have flanches or otherwise.

Second, "manufacturing india rubber by combining sulphur or matters containing sulphur or products of sulphur by grinding, kneading, or masticating the same in a manner suitable for making elastic thread or sheets and other articles, and yet retaining the property of piecing up and of kneading or masticating;" also "combining sulphur fumes with india rubber," and masticating the rubber combined, as above, "with phosphorous." The rubber is masticated with the sulphur, &c. in the usual manner, the rollers being heated. The sulphur fumes are combined with the rubber by passing them from a retort into the masticator. In applying fumes of sulphur, "hydrogen passed into the machine will be advantageous; or, in place thereof, phosphorous in small particles, or vapour thereof used in very small quantities, will be found highly beneficial." After masticating, the products are to be submitted to pressure (hydraulic is preferred), and the moulds heated externally to about 220° to 250°.

[Printed, 1s. 1d. See Repertory of Arts, vol. 15 (*enlarged series*), p. 224; London Journal (*Newton's*), vol. 35 (*conjoined series*), p. 21; Mechanics Magazine, vol. 51, p. 45.]

A.D. 1849, January 23.—N° 12,435.

DE BERGUE, CHARLES.—"Improvements in steam engines, in pumps, and in springs for railway and other purposes;" and these are, first, "the ball and socket joint for connecting the piston and piston rod, when connected with the tube described." The tube is hollow, "attached at its lower end to the piston, and moving through a stuffing box, on the cylinder cover, the internal diameter of the tube being such as to admit of the oscillating motion of the piston or connecting rod."

Second. "A peculiar mode of constructing pumps for raising water or other fluids." The bucket of the pump is made less in diameter than the bore of the pump, and is surrounded with a



flexible material, consisting of two pieces of vulcanized india rubber and cloth, made into the form of a frustrum of a cone, and attached by its narrow end to the bucket; the lower end is turned over or doubled back, and the bucket, with the valve and pump rod, is inserted in the pump barrel, and the larger or outer end of the flexible material firmly fixed to the pump barrel by means of a round ring of metal pressing its upper edges into a recess, coated with marine glue. In valves, the improvement is, placing on the top of the valve seating a circular piece of leather or vulcanized india rubber, and on the top of the india rubber is placed a circular plate of metal. A screw passes through the iron plate and piece of vulcanized rubber, and secures them to the valve.

Third. A peculiar mode of constructing atmospheric springs and steel springs for railway carriages. The atmospheric springs may be described as follows :—A cast-iron cylinder, open at both ends, with a cover, with a piston cast with a projecting piece which fits into the cover; a cone of flexible material shaped, as described above, is attached to the piston rod, and to the upper end of the cylinder. This spring is filled with compressed air by a pump..

[Printed, 1s. 4d. See *Mechanics' Magazine*, vol. 51, p. 92; and *Patent Journal*, vol. 7, p. 159.]

A.D. 1849, February 6.—N<sup>o</sup> 12,452.

BROWNE, JOHN.—“Improvements in constructing and rigging “ vessels, and improvements in atmospheric and other railways ;” and it is stated that the improvements proposed in the atmospheric railway are “ to do away with leakage by means of pressure,” as follows :—“ Over the orifice of the cylinder are two plates of iron, “ tin, or other substances. The plates are pressed together by “ means of a succession of springs, which press upon a slighter “ board, this board pressing upon the iron plate, which is made “ into a shape best to admit of the pressure. By this means are “ the plates pressed together, allowing of the travelling piston or “ connecting link to go through without admitting too much “ of the outward air from getting into the cylinder. Spring- “ wheeled pincers may be used, if required, as a further security “ from the admission of the outward air. These iron plates are “ held and continued in their position by being surrounded by “ leather, to the facing of which may be fixed gutta percha, on “ account of the friction. Above or below this range a long slip

“ of gutta percha, or other substance, may be made to act for  
“ and in the same manner as the iron plates, in the same manner  
“ covered with leather, as in the same manner pressed together,  
“ by means of a thin board pressed upon by a succession of  
“ springs.”

[Printed, 3d. See London Journal (*Newton's*), vol. 35 (*conjoined series*),  
p. 111; *Mechanics' Magazine*, vol. 51, p. 142; and *Patent Journal*, vol. 7,  
p. 193.]

A.D. 1849, February 8.—N<sup>o</sup> 12,466.

CLARKSON, THOMAS CHARLES.—“ Certain improvements in  
“ the manufacture and application of leather, and certain vegetable  
“ substances, to be used in combination with leather, india rubber,  
“ canvas, silk, cotton, wool, and other fibrous substances, in the  
“ manufacture of certain waterproof articles; and these are, first,  
“ The mode of tanning leather, in which the hide is suspended in  
“ the pits, and subjected to the action of a gradually charging  
“ fluid.”

Second. Combining thin or split hides in layers, placing the  
“ butt ” to the shoulder part of the hide, instead of employing  
thick substances of leather, as hitherto, in the manufacture of  
straps for driving bands or harness; also uniting the thicknesses  
of leather for a driving band or strap, while encircling a drum or  
other surface.

Third. “ Combining cork, wood, india rubber, and other vege-  
“ table substances in alternate layers, with leather or with fibrous  
“ materials, such as cotton, silk, canvas, or wool, and causing the  
“ several layers to adhere to each other by a solution of india  
“ rubber, marine glue, or other suitable cement, so as to produce  
“ waterproof material applicable for and in the manufacture of  
“ various articles.”

Fourth. “ Combining a layer or layers of cork, and a layer or  
“ layers of tarlatan, or other woven fibrous material, with a solu-  
“ tion of india rubber, in the formation of hat bodies, and also  
“ the application of a solution of india rubber to the manufacture  
“ of hat bodies of cork, for the purpose of retaining them in shape  
“ during and after their formation.”

[Printed, 3d. See *Mechanics' Magazine*, vol. 51, p. 141; and *Patent Journal*,  
vol. 8, p. 138 and 219.]

A.D. 1849, February 12.—N<sup>o</sup> 12,472.

NICKELS, CHRISTOPHER.—“Improvements in the manufacture of woollen and other fabrics;” and these are, first, “the mode of manufacturing milled, fulled, or felted fabrics,” by submitting fabrics, woven in bobbin net or twist lace machinery, to the process of felting or fulling, in like manner to those fabrics woven in looms of warp and weft, thrown in by a shuttle, have heretofore been milled, &c. These fabrics have numerous transverse threads proceeding “in diagonal directions from selvage to selvage, or else in the manner of what is called traight down weavings of lace machinery.” In place of silk, cotton, &c., yarns of wool, or material which will felt, is substituted.

Second. “The means described of holding and cutting the loops of warp fabrics,” and “combining gutta percha threads with warp fabrics. Using “two hooks in combination with a cutter,” “whereby the loops are held by the hooks, so that on the cutter moving between them the cut is made under the most favourable circumstances in respect to the holding of the loops.” The gutta percha is combined by “introducing it in threads or strands longitudinally or transversely, as other threads or strands have heretofore been introduced into warp fabrics, and then by passing such fabrics over or between heated surfaces the threads of gutta percha will get partially melted, and run together at the back of the fabric.”

[Printed, 4s. 10d. See Repertory of Arts, vol. 18 (*enlarged series*), p. 337; Mechanics' Magazine, vol. 51, p. 161; and Patent Journal, vol. 7, p. 215.]

A.D. 1849, February 28.—N<sup>o</sup> 12,485.

KURTZ, CLEMENT AUGUSTUS.—“Certain improvements in looms for weaving.” One of these improvements is, substituting for the cards for the patterns in Jacquard looms a long strip of paper, punctured or perforated with exceedingly small holes, by which a great saving, the cards being expensive, is effected; and in some instances some parts of the pattern paper are strengthened by folding the “edges of the paper, and having passed a piece of tape between such folds,” by connecting “the parts together with a solution of india rubber.”

[Printed, 4s. 7d. See Mechanics' Magazine, vol. 51, p. 210; and Patent Journal, vol. 8, p. 283.]

A.D. 1849, February 28.—N° 12,494.

**BRINDLEY, WILLIAM.**—"Improvements in the manufacture of waterproof paper;" these are, causing paper to be saturated with linseed oil, and after pressing out excess of oil, heating it in a suitable stove from 200° to 300° Fahrenheit, "the paper being kept opened out so that both surfaces may be acted on by the heat, and in about three hours the desired effect will be obtained." "The paper thus treated may be written or printed on, and paper hangings thus made will be found of great importance when the walls are damp;" "paper hangings may be either printed before or after rendering the same waterproof, excepting where the high temperatures will interfere with the colors."

[Printed, 3d. See Repertory of Arts, vol. 11 (*enlarged series*), p. 287; Mechanics' Magazine, vol. 51, p. 213; Patent Journal, vol. 7, p. 225; and Engineers and Architects' Journal, vol. 12, p. 373.]

A.D. 1849, March 3.—N° 12,502.

**WESTHEAD, EDWARD.**—"Certain improvements in the manufacture of waddings;" and these are, introducing "a series of threads, or of woven cloth or textile fabric, either on to the back or into the body of the wadding, as well as the substitution of gutta percha in the place of size for the backs of waddings."

[Printed, 3d. See Repertory of Arts, vol. 14 (*enlarged series*), p. 227; London Journal (*Newton's*), vol. 35 (*conjoined series*), p. 118; Mechanics' Magazine, vol. 51, p. 236; and Patent Journal, vol. 7, p. 263.]

A.D. 1849, March 14.—N° 12,511.

**MOORE, ROBERT ROSS ROWAN.**—"Improvements in the manufacture of letters and figures to be applied to shop fronts and other surfaces;" and these are,—

First. Manufacturing "letters and figures applicable to shop fronts and other purposes, by the application of gutta percha." The letters, &c. are preferred to be made by pressing the gutta percha when in a plastic state into moulds, and keeping them pressed till the gutta percha is cold, and after dressing, painting, &c.

Second. "The mode of manufacturing ornamental letters and figures applicable to shop fronts." A letter or figure is made in a frame of metal or other suitable material, capable of being glazed by glass, which may be of various colours. "The back

140 INDIA RUBBER AND GUTTA PERCHA :

“ or body of the letter is preferred to be made of gutta percha moulded as before, such material admits of the recesses being formed to receive the glass more readily than when the letters or figures are made of wood.”

[Printed, 6d. See London Journal (*Newton's*), vol. 35 (*conjoined series*), p. 179; *Mechanics' Magazine*, vol. 51, p. 283; and *Patent Journal*, vol. 7, p. 252.]

A.D. 1849, March 14.—N° 12,515.

PLUMMER, ROBERT.—“ Certain improvements in machinery, instruments, and processes employed in the preparation and manufacture of flax and other fibrous materials;” and these consist “ in improvements ” in the various machines for the manufacture of flax, &c. And one of the many “ improvements ” is, employing “ in the construction of instruments for holding flax and other materials while being brushed, heckled, scutched, or otherwise treated,” gutta percha in combination with wood or with iron “ or with both, or with any other suitable material.”

[Printed, 2s. 11d. See *Mechanics' Magazine*, vol. 51, p. 313, 337, and 371; *Artizan*, vol. 9, p. 150, 198, and 218.]

A.D. 1849, March 14.—N° 12,517.

SWAN, ALEXANDER.—“ Improvements in heating apparatus, and in applying hot and warm air to manufacturing and other purposes where the same are required;” these improvements have for their object the economizing of fuel employed in generating steam, in evaporating fluids, and in the distillation of coal, peat, or other like substances;” and in the apparatus described for generating steam is a “ regulating apparatus ” for opening or shutting the damper in the flue, which is worked by the pressure of the steam in a boiler heated by fire passing through that flue; it may be described as follows:—An upright cylinder is fixed on the top of a pipe having free communication with the boiler; in this cylinder is a metal plunger fitting loosely in it, and resting at its bottom upon a diaphragm of “ vulcanized caoutchouc ” or other suitable elastic substance capable of resisting the force of the steam;” at top this plunger has a rack which takes into a pinion fixed to the shaft of a grooved pulley; the damper is suspended over this pulley, and counterpoised on the opposite side by a weight; when the steam increases it raises the plunger by

pressing upon the elastic diaphragm, and the damper descends; "a reverse action takes place when the pressure of the steam is "reduced."

[Printed, 1s. 4d. See *Mechanics' Magazine*, vol. 51, pp. 232, 361; and *Patent Journal*, vol. 7, p. 250.]

A.D. 1849, March 26.—N° 12,535.

MASON, JOHN, and COLLIER, GEORGE.—"Certain improvements in machinery or apparatus for preparing and spinning cotton and other fibrous materials, and also improvements in the preparation of yarns or threads, and in the machinery or apparatus for weaving the same;" and one of many "improvements" is stated to be "coating and covering with gutta percha and its compounds, cylinders upon which cards are to be fixed and employed for preparing cotton and other fibrous substances for spinning." "This substance or its compounds may be put on the surface of the cylinders, either in a state of solution or in a plastic state, or as sheets." The cylinders may be corrugated or perforated at their surface to secure the gutta percha, &c., or sheets of the material may be sewed upon them in any way.

[Printed, 3s. 7d. See *Mechanics' Magazine*, vol. 51, p. 308; *Artizan*, vol. 10, p. 171; and *Patent Journal*, vol. 8, p. 16.]

A.D. 1849, April 16.—N° 12,569.

RUTHVEN, JOHN.—"Improvements in preserving lives and property from water and fire, and in producing pressure for various useful purposes." In preserving property from fire it is proposed to place tanks or cisterns filled with water on the upper part of buildings; and one of the improvements consists in applying screw-coupling stopcocks, and connecting by them gutta percha and prepared india-rubber pipes to the pipes from the tank or cistern," &c.

[Printed, 6d. See *Repertory of Arts*, vol. 15 (*enlarged series*), p. 21; *Mechanics' Magazine*, vol. 51, p. 381; and *Patent Journal* vol. 8, p. 58.]

A.D. 1849, April 17.—N° 12,575.

ALLIOTT, ALEXANDER.—"Improvements in apparatus for ascertaining and for marking or registering the force or pressure of wind, of water, and of steam, the weight of goods or sub-

## 142 INDIA RUBBER AND GUTTA PERCHA:

“stances, and the velocity of carriages; also an apparatus for ascertaining, under certain circumstances, the length of time elapsed after carriages have passed any given place, and for enabling the place or direction of floating bodies to be ascertained.” In carrying out this invention one of the improvements is said to be, employing “a flexible diaphragm of vulcanized india rubber of the peculiar form” described; this may be said to be semi-oval, having its ends extended, and it is stated that diaphragms of vulcanized india rubber have been before used as parts of apparatus for ascertaining the pressure of fluids, but never “of the peculiar form.”

[Printed, 2s. 6d. See *Mechanics' Magazine*, vol. 51, p. 381, and vol. 52, p. 361; and *Patent Journal*, vol. 8, p. 55.]

A.D. 1849, April 26.—N° 12,585.

SIMPSON, GEORGE, and FORSTER, THOMAS.—“Improvements in the manufacture or treating solvents of india rubber and other gums or substances;” and these are, first, manufacturing chloride or bichloride of carbon, and applying the same for dissolving india rubber, gutta percha, and other gums or gum resinous substances not soluble in water, thus obtaining new “solutions of those substances.” This is effected as follows:—Bisulphuret of carbon is distilled from a retort or still having a steam jacket, and passes to the bottom of a vessel heated similarly, and containing pentachloride of antimony; from the top of this second vessel a pipe leading to a condenser receives the chloride of carbon. The product is rectified by distilling with lime, and the resins are dissolved by it “in like manner to that heretofore resorted to when using the solvents heretofore employed.” India rubber is changed by the chloride, and is not so readily effected by cold, &c.

Second. “Treating coal oil with chloride of lime.” In place of pentachloride of antimony, having a solution of chloride of lime, passing the vapour of the coal oil with steam into it, and condensing as before.

[Printed, 5d. See *Repertory of Arts*, vol. 14 (*enlarged series*), p. 344; *London Journal (Newton's)*, vol. 35 (*conjoined series*), p. 332; and *Patent Journal*, vol. 8, p. 80.]

A.D. 1849, April 26.—N° 12,591.

BURKE, HENRY.—“Improvements in the manufacture of air-proof and water-proof fabrics, and in the preparation of caout-

"chouc and gutta percha, either alone or in combination with other materials, the same being applicable to articles of wearing apparel, bands, straps, and other similar useful purposes;" and these are, first, treating "caoutchouc or caoutchouc and gutta percha combined with" precipitated sulphuret of antimony, mixing by means of a masticator, submitting it to pressure, and afterwards to heat. It is stated that rubber so prepared is superior to that vulcanized by free sulphur. Sheets of considerable length may be made by spreading the material from the masticator on cloth saturated with chalk, &c., which allows the sheet to be separated from the cloth after it is heated. It may be spread on leather, &c., &c. mixed with colors, or otherwise, and heated. Cotton fleeces and other bodies are united by it in same manner as described in the Specification of Patent N° 11,055.

Second. Making water-proof fabrics without the shiny or polished appearance. These are made by coating the surface of cloth with a mixture of caoutchouc, &c. mixed with ground silk, cotton, &c., after the manner of flock.

Third. Manufacturing bands or straps for driving machinery by applying to such bands, either at the centre or on one or both sides, leather, canvas, &c., and cover one or both sides with india-rubber compound.

Fourth. "Applying metal guards, tips, or shields to gutta-percha heels and soles of boots." These tips, &c. are moulded in with the soles and heels when the gutta percha is in a plastic state, and by forming countersunk holes in the tips, &c., or forming projections on their inner side, they will be held firmly in their place.

[Printed, 4d. See Repertory of Arts, vol. 14 (*enlarged series*), p. 365; London Journal (*Newton's*), vol. 35 (*conjoined series*), p. 384; Mechanics Magazine, vol. 51, p. 430; and Patent Journal, vol. 8, p. 69.]

A.D. 1849, May 1.—N° 12,596.

MUNKITTRICK, ALEXANDER (*a communication*).—"An improved composition of matter which is applicable as a substitute for oil to the lubrication of machinery, and for other purposes." This consists of "caoutchouc dissolved in spirits of turpentine, or other solvent of that gum, carbonate of soda, glue, common animal or vegetable oil, or other cheap fatty matter and water," which may be used in various proportions. This "invention consists essentially in the combination of the oil



## 144 · INDIA RUBBER AND GUTTA PERCHA:

“ and the elastic gum, the other ingredients being merely for the  
 “ purpose of facilitating their admixture and correcting their  
 “ impurities where they are used in a crude state. But if the  
 “ oleagineous matter and gum employed are refined, most of the  
 “ other ingredients may be dispensed with.”

[Printed, 3d. See London Journal (*Newton's*), vol. 36 (*conjoined series*),  
 p. 98; *Mechanics' Magazine*, vol. 51, p. 447; *Practical Mechanics' Journal*,  
 vol. 2, p. 205; *Patent Journal*, vol. 8, p. 60; and *Engineers' and Architects'*  
*Journal*, vol. 12, p. 373.]

A.D. 1849, May 1.—Nº 12,597.

DALTON, JOHN.—“ A certain improvement or certain improve-  
 “ ments in printing calicoes and other surfaces.” These im-  
 “ provements are, first, in “ a lapping or covering to the  
 “ printing cylinder of machines used for the printing of calicoes,  
 “ muslins, carpets, papers,” &c. This is effected by substituting  
 “ for the ordinary lapping a web of woollen, woollen  
 “ and linen, or woollen and cotton texture, previously coated  
 “ over on one or both surfaces with a thin layer of gutta  
 “ percha.” The gutta percha is dissolved, by preference, “ in  
 “ benzole or bisulphuret of carbon,” “ in the proportion of five  
 “ pounds gutta percha to one gallon of the solvent, or there-  
 “ abouts.” This solution, heated proportionally to the nature of  
 the solvent, is applied by a copper roller “ engraved with a deeply-  
 “ reversed pin ground, the pin in relief.” The lapping being  
 coated is exposed and “ passed over several rollers and heated  
 “ steam chests or steam drums” to evaporate the solvent  
 thoroughly. A second coating may be applied in a similar  
 manner.

Second. Combining, preparing, and applying “ a blanket or  
 “ endless web to machines for printing calicoes,” &c. This is  
 effected much in the same manner as above, but using “ a second  
 “ similarly engraved roller placed after the other” “ to press the  
 “ solution more firmly between the close thick fibres of the  
 “ blanket, and render the coating perfectly adherent.” For  
 “ machines working at a temperature above 160 Fahrenheit”  
 a blanket is made “ by uniting two folds of the blanket or web  
 “ previously coated over on the inside surface with gutta percha.”

[Printed, 4d. See *Mechanics' Magazine*, vol. 51, p. 448; and *Patent Journal*,  
 vol. 8, p. 94.]

A.D. 1849, June 7.—N° 12,643.

PAYNE, EDWARD JOHN.—“Improvements in marine vessels, “in apparatus for the preservation of human life, and in “moulding, joining, and finishing hollow and solid figures composed wholly or in part of certain gums or combinations of “gums, and in apparatus and machinery to be used for the purposes above mentioned;” and these are, first, “the mode of “constructing life-boats or vessels.” In doing this, a number of air-tight compartments are formed. These are formed of gutta percha, or gutta percha and india rubber. Sheets of each are heated and pressed together. Wire webbing may be placed between the two sheets before pressing, or between two sheets of gutta percha. These sheets are formed by cutting into the shapes required.

Second, “forming, moulding, and shaping solid and hollow “figures, and other articles of gutta percha,” by pressing, &c. “The moulds for each figure consist of at least four pieces.”

Third, “dissolving, treating, and combining gutta percha, india rubber, gummy copal, gummy damar, resin, shellac, tar, pitch, linseed oil, sugar of lead, white of lead, litharge, alum, and spirits of turpentine, all or any of them, and producing thereby waterproofing compounds, varnishes, and paints to be employed for coating and covering the surfaces of articles, and as cements for joining articles, and whether combined with “colouring matters or not.”

[Printed, 1s. 2d. See *Mechanics' Magazine*, vol. 51, p. 571; and *Patent Journal*, vol. 8, p. 128.]

A.D. 1849, June 14.—N° 12,660.

HAINES, MICHAEL JOHN.—“Improvements in the manufacture of packing for steam engines, cylinders, and other purposes, part of which improvements are applicable to the manufacture of waterproof fabrics and leather;” and these are, “a series of horizontal layers of canvas, or other suitable fabric, cemented together by cements which will not be injuriously acted upon by the steam, vapour, or fluid.” These cements are composed of caoutchouc, turpentine, “gum damer jandrae,” juniper, naphtha, gum seymour, or mastic mixed in a certain manner and in certain proportions.

In a Disclaimer enrolled December 14, 1849, it is stated, that the invention intended to have been described under that part of

## 146 INDIA RUBBER AND GUTTA PERCHA:

the title, "part of which improvements are applicable to the "manufacture of waterproof fabrics," is not of such a novel nature as would make it desirable to retain it. It is, therefore, disclaimed.

[Printed, 6d. See Repertory of Arts, vol. 15 (*enlarged series*), p. 26; London Journal (*Newton's*), vol. 35 (*conjoined series*), p. 395; Mechanics' Magazine, vol. 51, p. 596; and Patent Journal, vol. 8, p. 152.]

A.D. 1849, June 27.—N° 12,678.

FORSTER, JOHN THOMAS.—"Improvements in building ships "boats, and other vessels; and also in the manufacture of boxes, "packing cases, roofs, and other structures requiring to be water- "proof;" and these are, applying "of planks and boards of "wood coated with gutta percha or gutta percha combined with "other matters, in the building of ships' boats, and other similar "vessels." The wood, by preference, is first coated "with "caoutchouc cement," and "veneered" by covering with thin sheets of gutta percha, which are pressed. Sometimes two or more thicknesses of thin plank are brought together by a water- proof cement, and coated on the outer surfaces by gutta percha alone, "or combined with other materials." Joints are covered with cement, and wood treenails, &c. "are dipped first into a "waterproof cement before driving them."

[Printed, 4d. See Mechanics' Magazine, vol. 52, p. 19; and Patent Journal, vol. 8, p. 178.]

A.D. 1849, June 26.—N° 12,671.

NICKELS, CHRISTOPHER. — "Improvements in the manu- "facture of woollen and other fabrics;" and these are in weaving cut piled fabrics, piled fabrics, or looped piled fabrics in looms and warp machines, or in twist lace machines, and in doing so "employing gutta percha as a means of holding the parts of the "weft from coming loose or being drawn out." In carrying out this, "whether weaving the fabric which is to be cut up into weft "in looms or warp machines, or in twist lace machines, introduce "one or more warp threads of gutta percha with the other warp "employed, and then before cutting each fabric into its several "parts each to form a weft, heat the gutta percha threads by "passing the fabric through between two rollers suitably heated, "and so as to cause the gutta percha threads to adhere to the

“ weft threads, and thus when the fabric is cut up, the gutta percha will hold the weft securely. The woven weft thus obtained is then to be woven into fabrics.”

[Printed, 3s. 5d. See Repertory of Arts, vol. 16 (*enlarged series*), p. 285; Mechanics' Magazine, vol. 51, p. 619; and Patent Journal, vol. 8, p. 161.]

A.D. 1849, July 4.—N° 12,684.

GRANTHAM, JOHN.—“ Improvements in sheathing ships and vessels;” and these are, first, “ applying copper or other metal sheathing to iron ships or vessels, by interposing sheathing or coating of a material not a conductor.” “ The first object in sheathing ships, &c. with non-conducting matter is to obtain a means of fixing the sheathing in a manner not to have any conduction communication between the iron of the vessel and the copper or other sheathing. The non-conducting matter may be wood, gutta percha, or compounds thereof.”

Second, “ applying external ribs or projections to ships or vessels for the purpose of facilitating the affixing of wood or other sheathing.”

Third, “ the arrangement or combination of mechanical parts into a machine for applying hot blast to the sides of a ship or vessel, to facilitate the application of sheathing,” for drying them, &c.

[Printed, 9d. See Repertory of Arts, vol. 15 (*enlarged series*), p. 146; London Journal (*Newton's*), vol. 37 (*conjoined series*), p. 94; Mechanics' Magazine, vol. 52, p. 36; Artizan, vol. 8, p. 56; and Patent Journal, vol. 8, p. 199.]

A.D. 1849, November 2.—N° 12,828.

HAINES, MICHAEL JOHN.—“ Improvements in the manufacture of bands for driving machinery, in hose or pipes, and buffers for railway purposes;” and these are, first, band for driving machinery.” These consist “ of a strong woven fabric of flax, hemp, or other fibrous material,” preferred to consist of strong cords of flax, both for the warp and weft.” This woven fabric is coated with gutta percha or compounds containing gutta percha, and bound with leather to protect the edges, the leather being caused to adhere, and is also stitched or sewed.”

Second, “ manufacturing hose or pipes, preferring ” to use gutta percha alone. It may, however, be combined with other

## 148 INDIA RUBBER AND GUTTA PERCHA :

matters, as is well understood. "The leather is in all cases prepared to receive the gutta percha (whether in solution or otherwise) in the following manner:"—"Scour the surfaces of the leather with a solution of sal ammoniac, allow it to dry, and then apply to those surfaces a solution of copal, when the leather will be ready to receive the gutta percha."

Third, "improvements in buffers for railway purposes." On the carriage is a plate fixed, and between the buffer head and the plate are placed "a series of layers of raw, dry, or buffalo hides."

[Printed, 1s. See Repertory of Arts, vol. 15 (*enlarged series*), p. 362; *Mechanics' Magazine*, vol. 52, p. 376; and *Patent Journal*, vol. 9, p. 55.]

A.D. 1850, January 12.—N<sup>o</sup> 12,927.

MILWAIN, JOHN.—"Certain improvements applicable to the closing of doors, windows, and shutters;" and these are, first, using "a moveable strap of india rubber or gutta percha applied to the joints of doors, windows, and shutters," for the purpose of preventing the passage of sound, air, dust, &c., "whether such strap be brought into action by the motion of the said doors, windows, or shutters, or by a subsequent operation of the hand." A rod may be inserted in the door or window, which on the closing of the door, &c. is caused to move laterally or otherwise by its end coming in contact with an adjustable stand fixed in the jamb; to the rod are attached one or more levers, which may be toggle-jointed, the opposite ends of which are depressed by the movement of the rod. In doing so, they depress to the floor a strip of gutta percha, and thereby fill up the opening below the door. On opening the door again the strip of gutta percha is elevated by means of the elasticity of two pieces of vulcanized india rubber. Other mechanical equivalent modes are shewn of obtaining this result.

Second, "applying india rubber or gutta percha to French windows, &c., which open after the manner of folding doors," "This consists in placing a piece of vulcanized india rubber in a recess cut in the window frame at the hinges, when the window is shut the rubber is compressed into a corresponding recess in the jamb, and that produces an air-tight joint; and pieces of vulcanized india rubber may be placed within the joint formed

“ by the two halves of a French window closing upon each other.”

[Printed, 1s. 4d. See London Journal (*Newton's*), vol. 38 (*conjoined series*), p. 110; *Mechanics' Magazine*, vol. 53, p. 53; and *Patent Journal*, vol. 9, p. 177.]

A.D. 1850, January 26.—N° 12,942.

DALTON, JOHN.—“ Certain improvements in and applicable to “ machinery or apparatus for bleaching, dyeing, printing, and “ finishing textile and other fabrics, and in the engraving of “ copper rollers and other metallic bodies.” These improvements are in cylinders or bowls to be employed as stated. The construction is as follows:—“ Take an iron shaft or cylinder about “ three inches square,” long in proportion as required, and “ attach to each end an iron plate or disk,” first having placed between these disks “ a number of disks of hard dry wood about “ three quarters of an inch in thickness,” having between each a coating of gutta percha brought to a “ temperature of about 360° “ F.” Next cover the surface “ of the wooden disks thus con- “ nected together with a coating of gutta percha ” “ about one “ and a half inches thick,” by revolving it over a fire. When cold, turn it true in a lathe, and smooth the surface “ by revolving “ it against a metallic roller with a little hot water,” &c.

(See “ Abridgments of Specifications upon Bleaching, Dyeing, “ and Printing.”)

[Printed, 6d. See *Mechanics' Magazine*, vol. 53, p. 97; *Patent Journal*, vol. 9, p. 210.]

A.D. 1850, February 21.—N° 12,971.

NEWTON, ALFRED VINCENT (*a communication*).—“ Improve- “ ments in separating and assorting solid materials or substances “ of different specific gravities;” and these are, first, cleaning “ the sieves and preventing the choking of the meshes thereof “ by means of tumbling blocks of any form, arranged between “ partitions or divisions within the sieves.” This apparatus has for its object “ to separate copper ores from the gangue or foreign “ matters,” &c.; and the invention consists in preventing dust, dirt, &c. accumulating in the meshes “ by means of blocks of “ india rubber, wood, or other suitable substance placed between “ partition plates or divisions attached to the shaft or otherwise,

150 INDIA RUBBER AND GUTTA PERCHA:

“ that the said blocks in moving around and falling may shake the sieves by gentle blows.”

Second, using “ a screen or screens, or sieve or sieves, combined with and arranged in the trunk or passage through which the current or currents of air pass, to act on the substances whilst falling by gravity, for the purpose of equalizing the current and preventing the formation of eddies, that the said current may act with equal force on each particle whilst falling.”

[Printed, 1s. 1d. See *Mechanics' Magazine*, vol. 53, p. 158; and *Patent Journal*, vol. 9, p. 261.]

A.D. 1850, March 2.—N° 12,986.

RICHARDS, THOMAS, TAYLOR, WILLIAM, and WYLDE, JAMES, the younger. — “ Improved rollers to be used in the manufacture of silk, cotton, woollen, and other fabrics.” This invention consists in constructing “ drawing rollers to be employed in the manufacture of silk, cotton, woollen, and other fabrics, by covering the peripheries of cylinders, composed of any suitable material, with tubes of vulcanized or metallo-thionized caoutchouc.” “ The india-rubber tubes or pipes by which the rollers are to be covered, after having been subjected to the vulcanizing or metallo-thionizing process, are to be boiled for a time, varying from four to six hours, in an alkaline solution (preferring caustic soda or caustic potass), to which add flower of sulphur. The alkalies have a tendency to render the caoutchouc more solid, while the sulphur gives to the surface a certain degree of roughness, which renders it better adapted for the operation of drawing.”

[Printed, 5d. See *London Journal (Newton's)*, vol. 37 (*conjoined series*), p. 174; *Mechanics' Magazine*, vol. 53, p. 199; and *Patent Journal*, vol. 9, p. 274.]

A.D. 1850, March 7.—N° 12,990.

STONES, WILLIAM BENSON. — “ Improvements in treating peat and other carbonaceous and ligneous matters, so as to obtain products therefrom.” And these consist of treating peat in a great number of ways, and to obtain products as fuel, gas, “ carbonohydrous ” “ bituminiferous ” substances, and in distilling peat in a certain manner a spirit like hydrocarbon is obtained, and which is named peatine, and which it is stated if treated and

properly rectified is useful for dissolving gutta percha, caoutchouc, &c.

(See "Abridgments of Specifications upon Gasmaking, &c.")

[Printed, 1s. See Repertory of Arts, vol. 17 (*enlarged series*), p. 16; Mechanics' Magazine, vol. 53, p. 219; and Patent Journal, vol. 9, p. 284.]

A.D. 1850, March 7.—N° 12,997.

TAYLER, JOHN, and HURST, RICHARD.—"Certain improvements in and applicable to looms for weaving, and in machinery or apparatus for preparing, balling, and winding warps or yarns;" and among these improvements one is stated to be the "application" "of caoutchouc or india rubber to the backs of reeds, or of the grooves containing them, or of bars or traps bearing against them, for the purpose of obtaining elasticity in the beat up, and of preserving the reeds from injury."

[Printed, 2s. See Mechanics' Magazine, vol. 53, p. 216; and Patent Journal vol. 10, pp. 2 and 10.]

A.D. 1850, March 7.—N° 12,998.

DE WITTE, GERARD JOHN.—"Improvements in machinery, apparatus, metallic and other substances, for the purposes of letter-press and other printing." These consist in "the formation, by a novel mode and composition, of type in cylinders, and attaining a more facile and swift process of printing, cutting, and folding;" and in carrying out these improvements a machine is described, whereby "designs of parallel or longitudinal lines, for example, may be printed in a great number of colors by the use of very few cylinders." The application of each of them is obtained by the aid of an apparatus composed in "the same fashion or form for all, and analogous to that which serves in typographical printing." "Its description will suffice to give a complete knowledge of the machine." "Two superposed cylinders are formed, the under one of hollow cast iron, covered with woollen cloth or vulcanized india rubber, and the lower one also of cast iron, furnished with a stereotype casing, on the surface of which is the design or designs in relief; between these two cylinders the subject to be printed in color passes. In order to obtain a very close and perfect impression, the two cylinders must be pressed firmly against each other; and for this purpose counterpoised or weighted levers are



152 INDIA RUBBER AND GUTTA PERCHA:

"usually employed." "As this would be very troublesome," place between the screws and cushions a plate or band of vulcanized india rubber, which serves as a spring. The elastic body so interposed has to perform also the office of correcting any defect in the cylindricity of the stereotype, and to husband or save the motive power employed. The stereotype cylinder is surmounted by two cylinders composed of gelatine covered with a thin coating of vulcanized caoutchouc, or any other substance proof against color. Above these is a metal cylinder, true as possible, against which presses a hopper, which may be moved forward and retired as well; a circular brush, situated below this hopper, lightly brushes the last-named cylinder. The color being placed in the hopper passes between the cylinder and the lower edge of the hopper, and is spread by the brush (which is endowed with a double movement, circular and backwards and forwards, 'to go and come,') and thence by the rollers of gelatine to be deposited on the relief of the design, and thence is applied to the subject to be printed."

[Printed, 2s. 11d. See *Mechanics' Magazine*, vol. 53, p. 215; *Patent Journal*, vol. 9, p. 185.]

A.D. 1850, March 23.—N° 13,021.

NEWTON, ALFRED VINCENT.—"Improvements in the preparation of materials for the production of a composition applicable to the manufacture of buttons, knife and razor handles, ink-stands, door knobs, and other articles where hardness, strength, and durability are required."

[No Specification enrolled.]

A.D. 1850, April 5.—N° 13,032.

GOODALL, JONATHAN CHARLES.—"Improvements in machinery for cutting paper;" these are, first, "the arranging machinery for cutting paper in such manner that the knife or cutting edge shall be fixed and the table moved thereto."

Second, "the means of pressing the paper on the tables."

Third, "the application of gutta percha on the table for receiving the cutting edge."

(See "Abridgments of Specifications upon Paper, Pasteboard, Papier Mâché," Part II.)

[Printed, 1s. 3d. See *Repertory of Arts*, vol. 17 (*enlarged series*), p. 33; *Mechanics' Magazine*, vol. 53, p. 299; *Patent Journal*, vol. 10, p. 44.]

A.D. 1850, April 15.—N° 13,043.

DE BERGUE, CHARLES.—“Certain improvements in locomotive and other steam engines, also in buffers for railway purposes;” and these are, in steam engines,—

First. “The application” of a small piston or pistons for communicating an expanding motion to the rings of metallic pistons, whereby a certain amount of pressure upon the expanding ring can be ensured and regulated by the size of the small pistons.”

Second. “The arrangement for relieving the cylinder of a portion of the weight of the piston, by removing a portion of the junk rings and allowing the piston to rest principally upon the packing rings.”

Third. “The general management and combination of parts with regard to buffers for railway purposes.” A station buffer is described as follows:—A strong iron plate with two side cheeks (having four projecting pieces) somewhat in the form of a box or trough, and a strong cast-iron plate with four grooves in its edges to receive the projecting pieces of the side cheeks which are secured together by six wrought-iron cotter bolts with iron rings, and rings (washers) of vulcanized india-rubber or steel springs. A strong beam of timber somewhat tapered, called a buffer beam, “which may be coated with iron, projects about six feet in front of the box, and if struck by an engine is driven between the plates of the box, the pressure against the rubber rings gradually increasing until the buffer beams come to a stand still.” After the buffer beams come to a stand still the cotters are drawn back so as to slacken the rubber rings, the buffer beams drawn out, and the cotters driven up again. Another part of the improvements in buffers “consists in making the cylinder and piston part of vulcanized india-rubber buffers (described in former Patents), so that when the buffer is driven up the wood comes in contact with the end of the cylinder in place of two metallic surfaces,” &c.

[Printed, 1s. 4d. See *Mechanics' Magazine*, vol. 53, p. 317; and *Patent Journal*, vol. 10, p. 31.]

A.D. 1850, April 23.—N° 13,062.

SIEMENS, ERNST WERNER.—“Improvements in electric telegraphs,” and these are very numerous, and in the manufacture of coated wire for electric telegraph purposes; first, “arranging machinery for coating the wires with two cylinders and pistons,

" in such a manner that the pressure of the semifluid mass is equalized." Second, "arranging those cylinders, or the cylinder when only one is used, in such a manner that they may be removed and replaced by others while the former are being recharged." Third, "consolidating the gutta percha or its compounds within such cylinders in vacuo." For coating the wire, two cylinders, narrowed each at one end, containing the coating material, have their narrowed ends brought to a centre piece fixed to the same frame as they are. This centre piece forms a shallow passage of the same breadth as the narrow cylinder ends, which are thus in communication with each other. The upper and lower surfaces of this passage are perforated vertically with twelve holes; in these holes pieces of metal or bushes are put; the space left in the lower surface is the size of the uncovered wire, and that in the upper the size of the covered wire. The wire passes upwards, and as it passes through the centre pieces gets coated by the coating material, pushed forward by an arrangement of piston rods in each of the cylinders. By an arrangement the piston rods are drawn back and the cylinders removed to be filled with gutta percha. When a thick coating is required, the coated wire is guided higher and passed through other arrangements as above. Smaller cylinders are filled with the coating materials, and by an arrangement of an air pump, &c. exhausted, and during exhaustion pressed up by a piston.

See "Abridgments of Specifications upon Electricity, Magnetism," &c.

[Printed, 3s. 6d. See *Mechanics' Magazine*, vol. 53, p. 356; *Practical Mechanics' Journal*, vol. 5, p. 25; and *Patent Journal*, vol. 10, p. 69.]

A.D. 1850, May 7.—N<sup>o</sup> 13,069.

GERARD, GUSTAVE EUGENE MICHAEL.—"Improvements in dissolving caoutchouc (india rubber) and gutta percha." These are said to be "mixing with the solvent, of whatever nature it may be, a certain quantity of alcohol," and afterwards "macerate the caoutchouc or gutta percha;" "they will expand a very little, and at the end of twenty-four hours it will become of the state of paste, and may be moulded into any required form." The solvents mixed with the alcohol, and which are preferred, are "sulphuret of carbon, sulphuric ether, naphtha, essential oils of coal of turpentine, and chloroform."

[Printed, 3d. See *Repertory of Arts*, vol. 16 (enlarged series), p. 34; *London Journal (Newton's)*, vol. 41 (conjoined series), p. 38; *Mechanics' Magazine*, vol. 83, p. 379; and *Patent Journal*, vol. 10, p. 95.]

A.D. 1850, May 7.—N° 13,072.

TATHAM, JOHN, and CHEETHAM, DAVID.—“ Certain improvements for machinery or apparatus and operations connected with the manufacture of cotton, wool, silk, and other fibrous substances and fabrics, and in the application of certain materials to the manufacture of textile fabrics;” and these improvements are in various parts of the machinery employed in the above manufacture, and one of them is “ forming the caps or covers of the feet of spindles used in roving and spinning machines of gutta percha or its compounds;” and as the usual form of such caps or covers may still be adapted, “ no description thereof will be necessary; and with respect to the mode of producing them, they may be shaped by pressure in dies, or by any other mode employed in the manufacture of such materials.”

[Printed, 1s. 4d. See *Mechanics' Magazine*, vol. 53, p. 397; and *Patent Journal*, vol. 10, p. 65.]

A.D. 1850, May 25.—N° 13,081.

RADLEY, WILLIAM, and MEYER, FREDERICK.—“ Improvements in treating fatty, oleaginous, resinous, bitumenous, and cerous bodies in the manufacture and application of them and of their components and subsidiary products, together with the apparatus to be employed therein, to new and other useful purposes;” and one part of this invention relates to the “ combinations of the organic acids with metallic oxides generally, and particularly the oleic and elaidic, stearic and margaric, linic and cannabic, pinic and colopholic, the sylvic and pinaric. The carbolic, nigrinic, tanno-melanic, humic-melassic, glyceric, crenic, apocrenic, glucic, brunolic, asphaltic, bdellie, butyric, palmic, palmitic, palmitonic, and cocinic acids, with the oxides of aluminum, calcium, barium, magnesium, strontium, iron, copper, zinc, tin, manganese, cobalt, antimony, arsenic, lead, nickel, and chromium, for the production of saponaceous and other compounds which are denominated generically ‘ sapals ’ from fatty and oleaginous acids, and ‘ pinals ’ from resinous and bitumenous acids, with bases respectively.” When these substances are “ blended to a plastic state, at a temperature varying from 100° to 250°, according to the season of the year and other circumstances of requirement, with some or any of the least volatile of the oils, coal tar, or their congeneric exemplars

“ of wood and animal tars, and a smear cloth formed by spreading  
 “ the compound by any suitable process or machine upon canvas,  
 “ lime, cotton, of other textile fabric, or upon thin slices of wood  
 “ called scaleboard or cork. The same, laid one upon the other,  
 “ when suitably solidified by evaporative and refrigerative con-  
 “ gelation, and subsequently heated to make the ‘sapaline’ surface  
 “ adhesive, will serve to form rings for the pistons of steam  
 “ engines, air-pump bucket packings, heat-retaining envelopes  
 “ for steam and water pipes, flexible feed pipes, and all other  
 “ similar uses where heat is concerned with water, oils, or gases,  
 “ as well as for rings for pipe and other joints, strips for rendering  
 “ plank-made cisterns water-tight; and, when dissolved in essen-  
 “ tial oil of turpentine or the hydrochlorates of chlorides of asce-  
 “ tute or formule, as hydrofuge applications to walls, waggon and  
 “ cart covers, hat bodies and boxes, trunks, and all other similar  
 “ uses and applications. In the preparation of atmofuge com-  
 “ pounds which are required to possess considerable elasticity and  
 “ cohesion, the use of the tar or bitumen resulting from the dis-  
 “ tillation of peat and schistose bitumens when deprived of the  
 “ essential oil or oils upon which the objectionable odour of such  
 “ compounds depends,” is preferred, &c. &c.

[Printed, 1s. 5d. See *Mechanics’ Magazine*, vol. 53, p. 456; and *Patent Journal*, vol. 10, p. 104 and 115.]

A.D. 1850, June 6.—N° 13,103.

NEWTON, WILLIAM EDWARD (*a communication*).—“ Improve-  
 “ ments applicable to boots, shoes, and other coverings for or  
 “ appliances to the feet;” and these are, first, providing the  
 under surface of these articles, made of india rubber, with metallic  
 points, so as to render them less liable to slip; and this is effected  
 by perforating the under sole with holes, inserting in each a rivet.  
 The sole is attached to the shoe in the usual way. The points of  
 the rivets should only project very slightly, not more than to be  
 felt when passing the hand over the sole. Other modes of effecting  
 this are given.

Second, “employing of a partial or entire sole,” in combination  
 “with an elastic strap,” for the “purpose of preventing the  
 “wearer from slipping on smooth surfaces.” The strap is vul-  
 canized india rubber, and passes round the heel. The sole is  
 prepared as before; or an entire sole may have a toe piece and  
 the heel strap.

Third, relates to "making that kind of shoes known as clogs" "of india-rubber sponge," "moulded of the desired form with the "upper part of the sole." The india rubber, prepared in the usual manner for vulcanizing, is mixed with sugar or resin in certain proportions, formed into the clog, and vulcanized "by heat, by which it is rendered spongy and light." The clogs are also moulded with a rim and protuberances on the upper surface, to elevate the foot from the ground without making the article of too great weight.

Fourth, making boots, &c. "pervious to the perspiration of the wearer by making such articles of sheet rubber previously perforated with minute holes."

[Printed, 4d. See London Journal (*Newton's*), vol. 41 (*conjoined series*), p. 89; *Mechanics' Magazine*, vol. 53, p. 476; and *Patent Journal*, vol. 10, p. 203.]

A.D. 1850, June 8.—N° 13,109.

NEWTON, WILLIAM (*a communication*).—"Certain improvements in the manufacture of cords, ropes, bands, strong cloths, quiltings, sack, and cushions, in which manufacture caoutchouc forms an essential ingredient, and in the application of parts of these improvements to the manufacture of pads, stoppers, tubes, boxes, baskets, coverings, wrappers, and other like articles of utility." First, "making of the various articles herein enumerated, as well as other like or similar articles, by winding or connecting cords together of india-rubber vellum" in the green state, and then submitting the same to the process of curing, to secure the union of the various parts "the vellum" is composed of "metallic or vulcanized india rubber, but before it has been cured by heat, and of about the thickness of the intended fabric," combined with "a thin fleece or bat of cotton or other fibrous substance." Second, "making cellular india-rubber cloth by uniting at intermediate places two sheets of prepared india rubber, vellum tissue, or vegetable leather, or other fabric made of india rubber, compounded or united to or with fibrous substances, by interposing some non-adhesive substance or substances, where the two sheets are not to be united, to form the cells, which cells may be filled with water or other liquid, or with atmospheric air or other gas, or filled in with some elastic, yielding, or buoyant substance or substances, such as carded cotton, horsehair, cork, &c., such elastic substance or substances, in the latter case, being used as the substitute for the non-adhesive

158 INDIA RUBBER AND GUTTA PERCHA:

" substance used to form the cells." Third, " the method of making what is denominated 'strong cloth,' which is composed of india rubber, and a bat or fleece of cotton or other fibrous substance," by " passing the bat or fleece of cotton or other fibrous substance, together with the dissolved india rubber, or the preparations thereof, between calendering rollers, with the bat or fleece in contact with an elastic substance either surrounding one roller or passing between the rollers, which put pressure on the surface of the bat or fleece, a glazed or other apron being interposed between the gum and the roller not in contact with the elastic substance."

[Printed, 4d. See Repertory of Arts, vol. 20 (*enlarged series*), p. 187, and p. 194, for Disclaimer; London Journal (*Newton's*), vol. 41 (*conjoined series*), p. 33; Mechanics' Magazine, vol. 33, p. 476; and Patent Journal, vol. 11, p. 2.]

A.D. 1850, June 12.—N° 13,128.

NEWTON, ALFRED VINCENT (*a communication*).—"Improve-ments in the production of gases to be used for lighting, heating, and motive-power purposes." These consist "in certain improvements in magneto-electrical apparatus for decomposing water or other fluids, in order that the gases evolved therefrom may be applied to various useful purposes;" and in carrying out these "tubular coils are employed, and which may be made of some metal that will not easily corrode or oxidate, the same being insulated externally; or they may be made of some non-conducting substance (such as gutta percha tubing) filled with the liquid, and a metallic conducting wire inserted therein."

(See "Abridgments of Specifications upon Gas, &c.," "Electricity, &c.")

[Printed, 2s. 3d. See London Journal (*Newton's*), vol. 38 (*conjoined series*), p. 240; Mechanics' Magazine, vol. 54, p. 181; and Patent Journal, vol. 10, pp. 257, 269.]

A.D. 1850, June 23.—N° 13,146.

HUNT, JOHN.—"Improvements in forming and moulding plastic substances, and the machinery and apparatus employed therein;" and these are, first, "combining, constructing, and arranging a machine or machines for the purposes of compressing gutta percha, or any other similar plastic substance, by means of

“ pistons working in cylinders charged with the ingredient, and  
 “ furnished with steam jackets or casings to maintain a proper  
 “ temperature ;” the substance “ is forced by pistons alternately  
 “ to keep up a continuous supply into and through a chamber  
 “ piece bolted or screwed on to the bottom ends of the cylinders,”  
 furnished with two cocks, one from each cylinder, alternately open  
 and shut as the plastic substance may be alternately forced from  
 one cylinder and the other through the said cocks, and through  
 hollow cores or rings seated or fixed in the said chamber piece,  
 from which the gutta percha or other plastic substance is made to  
 exude into and about moulds or forms, for the purpose of making  
 continuous tubing, or covering or coating wires, or for producing  
 mouldings or beadings, &c.

Second, “ relates to a machine for producing pattern moulds,  
 “ for the purpose of casting into or compressing plastic sub-  
 “ stances, the more especially for the making, forming, and  
 “ producing bevil gearing of small diameter from the said plastic  
 “ substances.”

Third, “ relates to a method of forming bevil wheels and  
 “ pinions.”

Fourth, “ relates to the forming and moulding plastic sub-  
 “ stances by means of such pattern moulds, and this is by placing  
 “ it on a piece of metal, or any suitable material, having in its  
 “ centre an upright piece or spindle, turned so as to fit easily into  
 “ the centre of the mould, and sufficiently long to pass through  
 “ and project beyond it.” “ This piece, with the cut mould upon  
 “ it, is then placed in a box or frame,” “ a sufficient quantity of  
 “ gutta percha, or other suitable plastic substance, having been  
 “ first brought into a state fit for moulding, is then pressed into  
 “ and upon the cut mould ; a top or cover of the proper size and  
 “ figure to fit easily into the box or frame,” “ and having a hole  
 “ bored or cut, into which the upright piece or spindle above  
 “ described fits, is then forcibly pressed upon the gutta percha, or  
 “ other suitable plastic substance, and allowed to remain until  
 “ the gutta percha or plastic substance has become set.”

[Printed, 1s. 10d. See *Mechanics' Magazine*, vol. 53, p. 518; and *Patent Journal*, vol. 10, p. 161.]

A.D. 1850, July 9.—N<sup>o</sup> 13,170.

NEWTON, ALFRED VINCENT (*a communication*).—“ Improve-  
 “ ments in the preparation and manufacture of caoutchouc or



## 160 INDIA RUBBER AND GUTTA PERCHA:

"india rubber;" and these are, using "gum lac or shellac in its various forms in the preparation or manufacture of caoutchouc or india rubber, with or without the application of artificial heat." Any of the kinds of lac are combined with india rubber in various proportions, according to what purpose the result is to applied, and either by grinding or by their solvents. When the compound is intended to be used in certain manufactures, sulphur in small quantity is mixed with it. The fabric thus made with, or dusted with sulphur, is deprived of its tackiness by exposure to the sun. A cement is made of these substances, mixed with sulphur; any manufactures of it may be heated, and thus vulcanized. In heating, following the processes described in Specification of Patent N° 10,327, "earths, oxides, or carbonates, or salts of lead, or zinc, or other metals," may be mixed with this compound.

[Printed, 3d. See London Journal (*Newton's*), vol. 39 (*conjoined series*), p. 434; *Mechanics' Magazine*, vol. 54, p. 58; and Patent Journal, vol. 10, p. 210.]

A.D. 1850, July 23.—N° 13,190.

JENNINGS, HENRY CONSTANTINE.—"Improvements in rendering canvas and other fabrics and leather waterproof;" and these are, using metallic soaps, however obtained, combined with raw linseed oil, &c., for the above purposes. As an example, a certain quantity of soap is dissolved by boiling with water in a copper; to this is added sulphate of zinc; a decomposition takes place, and a soap of zinc or a metallic soap is formed; this is gathered and washed, &c., is ready for use. Raw linseed oil is now boiled with American pearlash till the liquid becomes white and opaque; a certain amount of animal charcoal added; the whole boiled and filtered; then add in certain proportions acetate of lead, litharge, red lead, black rosin; boil the whole; add metallic soap, and add a solution of caoutchouc in turpentine. For leather, metallic soap is dissolved in raw linseed oil, at a given temperature. These are applied by brushes, or by immersing. Any metallic salt may be used to produce the metallic soap, "and each metal gives its own peculiar color to the soap."

[Printed, 3d. See Repertory of Arts, vol. 17 (*enlarged series*), p. 100; *Mechanics' Magazine*, vol. 54, p. 96; and Patent Journal, vol. 10, p. 199.]

A.D. 1850, July 25.—N° 13,195.

**BELL, CHARLES WILLIAM.**—“Improvements in apparatus connected with waterclosets, drains, and cesspools, and gas and air traps;” and these are, “constructing passages of india rubber in combination with waterclosets, drains, and cesspools, and gas and air traps, in such manner that they will allow of the passage of” the “sewage and other liquids and matters suspended in them, gases and other fluids, in one direction, and will, by collapsing, prevent the return by the passage of vapours or matters in the opposite direction.” The best way, it is stated, to obtain such passages of india rubber is to cause the part required to be collapsed and firmly held so during vulcanization. But although india rubber is preferred, other matters may be combined with it, as long as it is elastic enough to collapse by its own elasticity, when free to do so.”

[Printed, 1s. 4d. See London Journal (*Newton's*), vol. 38 (*conjoined series*), p. 177; *Mechanics' Magazine*, vol. 54, p. 99; and Patent Journal, vol. 10, p. 211.]

A.D. 1850, June 31.—N° 13,196.

**HELBRONNER, RODOLPHE** (*a communication*).—“Improvements in preventing the external air and dust and noise from entering apartments:” and these are the “means of manufacturing and applying rolls of fibrous materials for preventing air, dust, and noise entering apartments:—A spindle receives motion from a pulley fixed upon it; the spindle carries two wires, between which the fibres, &c. are brought and secured by a hinged flap let down upon the wires; on the spindle rotating the roll is formed, and is afterwards coated with any suitable cement. If it be desired to be made waterproof, “preferring to employ a solution of india rubber or of gutta percha, which is spread or applied by a brush to the outer surface of the roll of fibre, and the same is then hung up to dry” “by means of a string.”

[Printed, 9d. See London Journal (*Newton's*), vol. 38 (*conjoined series*), p. 250; *Mechanics' Magazine*, vol. 54, p. 115; and Patent Journal, vol. 10, p. 222.]

A.D. 1850, September 12.—N° 13,253.

**LONGDON, ROBERT**, the younger, and **TABBERER, THOMAS PARKER.**—“Improvements in the manufacture of looped fabrics;” and one of these improvements is “a mode of em-

162 INDIA RUBBER AND GUTTA PERCHA :

" plying india rubber in looped fabrics when the india rubber is " employed in an elastic state." The thread carrier is a tube down which the india rubber proceeds, and is delivered at the lower end; a rod is made to pass at right angles through this tube, having an eye for the passage of the india rubber; by drawing this rod to one side, which is done by means of a cord at each end, the india rubber is held, "and the extent of stretch " given to the india rubber may be regulated by the workman;" when the rod is retained tight "to prevent the needles being " drawn together, the points are used fixed to the rafter."

Another improvement is, "the mode of making the socks or " uppers of boots" by combining "with the elastic stocking " fabric portions of elastic fabric containing india rubber." Preferred to be made as above described.

[Printed, 1s. See Repertory of Arts, vol. 17 (*enlarged series*), p. 262; London Journal (*Newton's*), vol. 38 (*conjoined series*), p. 254; and Mechanics' Magazine, vol. 54, p. 238.]

A.D. 1850, September 19.—N° 13,257.

CHRISTEN, HENRI JEREMY. — "Improvements in cylinder " printing;" these are, "placing at the back of the fabric which " it is desired to print a design or pattern, hollow and in " relief, which will cause parts of the fabric which is to be " printed by the engraved cylinder to be pressed in contact " with the engraved surface of the cylinder, whilst other parts of " the fabric where the hollows in the pattern are will not be pressed " on, and therefore will not be printed by the engraved cylinder." The cloth to be printed is pressed against the cylinder by an endless fabric made by "cementing four or other suitable number " of thicknesses of cotton or other fabric by a suitable flexible " cement (gutta percha cement is preferred), and on to this a " surface of woollen fabric is cemented, the pattern of the plain " part or the part which is not to be printed being produced by " cutting away" "parts of the surface of woollen cloth."

(See "Abridgements of Specifications upon Bleaching, Dyeing, " and Printing.")

[Printed, 5d. See Repertory of Arts, vol. 17 (*enlarged series*), p. 274; London Journal (*Newton's*), vol. 38 (*conjoined series*), p. 261; and Mechanics' Magazine, vol. 54, p. 258.]

A.D. 1850, October 24.—N° 13,300.

JACOBS, SAMUEL. — "Certain improvements in printing on " woollen, cotton, paper, and other substances, parts of which im-

“ improvements are applicable also to the purposes of coloring, “ shading, tinting, or varnishing such substances.” The principal feature of this invention consists in a new and peculiar arrangement and construction of the color trough or vessel wherein the several different colors are placed, to be afterwards taken up separately or collectively by a roller which revolves in such trough, the roller giving off the color or colors so taken up to the cut or engraved pattern or cast type with which the said roller is in forced contact. And it is proposed to employ several of these color rollers and troughs when the design or pattern to be printed is elaborate, &c. The color trough “ has slits corresponding with “ the width of fillets on the roller,” which prints the direct pattern. “ These fillets may be formed by cutting grooves not “ of the solid metals, gutta percha, or other substance,” &c. When necessary the rings or fillets “ will be covered with a “ suitable substance, vulcanized india rubber, felt, woollen cloth, “ or composition ” composed “ of oil, resin, or resinous gum and “ gutta percha,” &c. The composition used “ for varnishing the “ troughs, sealing the joints and connections of pipes, is com- “ posed of mineral naphtha, resin, or resinous gums and gutta “ percha.”

(See “ Abridgments of Specifications upon Bleaching, Dyeing, “ and Printing ”)

[Printed, 3s. 10d. See Mechanics' Magazine, vol. 54, p. 359; Practical Mechanics' Journal, vol. 5, pp. 32 and 124; and Patent Journal, vol. 12, p. 47.]

A.D. 1850, November 7.—N<sup>o</sup> 13,326.

LUCAS, ROBERT (*a communication*).—“ Improvements in tele- “ graphic and printing apparatus : ” and these are, covering cylinders made of gutta percha, wood, iron, or any other suitable material with a sheet of gutta percha, which has a pattern projecting above its general surface, forming either letters or other figures, by which books, newspapers, furniture, papers, calicoes, and other fabrics may be printed when such cylinder is substituted in any of the well-known machines used in printing for those which are now used, the surfaces of which consist of metal, wood, or combinations of metal, wood, and other substances than gutta percha.”

“ The gutta percha for the printing plate is prepared by taking “ it in a divided state and immersing it in the nitric or nitrous “ acid of commerce, either concentrated or diluted until it becomes

164 INDIA RUBBER AND GUTTA PERCHA:

“ thereby in a soft state, when it is to be taken out of the acid  
“ and placed for an hour or two in a solution of carbonate of soda  
“ or other alkali, in certain proportions.”

[Printed, 3*d*. See *Mechanics' Magazine*, vol. 54. p. 398.]

A.D. 1850, November 14.—N<sup>o</sup> 13,344.

LIEBHABER, JOSEPH CONRAD BARON.—“ Improvements in  
“ blasting rocks, also in working marble and stone, and in pre-  
“ paring products therefrom:” and in carrying out this invention  
one of the improvements is, employing gutta percha to the pur-  
pose of blasting rocks; the tubes and vessels are made of gutta  
percha, “ they not being so readily acted upon by the acid as the  
“ metal ones;” the acid being introduced into the rocks by such  
tubes and vessels for the purpose of dissolving them.

[Printed, 11*d*. See *Repertory of Arts*, vol. 18 (*enlarged series*), p. 15; *Mechanics' Magazine*, vol. 54, p. 415; and *Patent Journal*, vol. 11, p. 184.]

A.D. 1850, November 13.—N<sup>o</sup> 13,372.

CHABERT, JOSEPH EUGÈNE (*a communication*).—“ Improve-  
“ ments in machinery for washing and drying linen and other  
“ fabrics.” The washing and rinsing of the fabrics “ is performed  
“ by a frame placed in a vessel, having given to it a to-and-fro  
“ horizontal rectilinear movement, or with a to-and-fro oscillating  
“ movement; or thirdly, a to-and-fro circular movement.” The  
linen to be washed is kept in its position on the frame “ by bands  
“ of india rubber, or other suitable material being placed across  
“ the frame.”

(See “Abridgments of Specifications upon Bleaching, Dyeing,  
“ and Printing.”)

[Printed, 8*d*. See *Repertory of Arts*, vol. 18 (*enlarged series*), p. 145; *Mechanics' Magazine*, vol. 54, p. 459; and *Patent Journal*, vol. 11, p. 108.]

A.D. 1850, December 27.—N<sup>o</sup> 13,431.

MENOTTI, CELESTE.—“ Certain chemical compositions for  
“ rendering cotton, linen, woollen, silk, and other fabrics imper-  
“ vious to water, and fixing colors in dyeing,” which compositions  
are called “hydrofugine.” The following salts may be employed  
to make such solutions:—

First, sulphate of alumina or sulphate of alumina and potash, or  
alumina and ammonia, or sulphates of iron or copper, or chloride  
of tin,

Second, oleic, stearic, or margaric acids or soap or soapy substances.

Third, alcohol of a certain strength is poured on the fatty acids or soaps, and amalgamated. The mixture is put on to a felt filter, the liquid extracted by pressure, "and the salts dried" and ground and dissolved in salt water and filtered. Into this solution the material "to be rendered impervious to moisture and pervious to " air " is passed and dipped, and afterwards dried.

In a Disclaimer enrolled 27th June, 1851, it is stated that the invention which was intended to have been described under the following words in the title, "and fixing colors in dyeing," is not of such public utility as would make it desirable to retain it, therefore it is disclaimed.

[Printed, 4d. See *Mechanics' Magazine*, vol. 55, p. 17; and *Patent Journal* vol. 11, p. 161.]

A.D. 1851, January 11.—N° 13,445.

MELVILLE, WILLIAM.—"Certain improvements in manufaturing and printing carpets, and other fabrics;" these improvements relate to various parts of the manufacture, and in one part it is stated that "to carry forward the yarn and preserve it from " disarrangement during the printing action, as well as from " falling down upon the unfigured or dirty portion of the printing " cylinders," "an endless web of wire cloth, or other suitable " permeable material," "is employed." "This wire cloth is " passed over the printing cylinders with the yarn to be printed " on its upper surface, so that the cylinders, instead of impressing " colour directly on the yarn itself, deliver it against the lower " surface of the permeable fabric, through which it passes to the " yarn. Above the yarn again an endless web " of waterproof material or blanket is passed along with the wire cloth and yarn to act in connexion with the wire cloth for the purpose of maintaining the regular tension of the yarn. There are thus three layers of material passed simultaneously, through or over the printing cylinders, the wire cloth below, then the yarn, and finally the " blanket."

[Printed, 1s. 9d. See *Mechanics' Magazine*, vol. 55, p. 74; *Practical Mechanics' Journal*, vol. 4, p. 109; and *Patent Journal*, vol. 11, p. 194.]

A.D. 1851, January 16.—N° 13,453.

BUCHHOLZ, GUSTAV ADOLPH.—"Of improvements in printing, and in the manufacture of printing apparatus, and also in

"folding and cutting apparatus;" and these are, first, the machinery "for making rollers or cylinders for printing" and the mode in which they "are constructed." The machinery may be described as follows:—A press, in the middle of which is a hollow cylinder composed of two similar halves in which a hollow conical drum is placed, so as to leave a concentric space. "The matrix, "a thin sheet or cylinder of gutta percha," with a sunken impression on its inner surface, is placed within the inside of the cylinder, and another thin cylinder of gutta percha with its exterior surface is placed in close contact with the impressed surface of the matrix. A sufficient quantity of gutta percha softened by heat is forced by a piston into a space, where it warms the plain gutta percha cylinder, and presses it closely into the matrix, so that it may receive an exact impression of the matrix, which it retains when cold. The gutta percha which is pressed into the space unites with the drum, and thus forms a solid coating on the outside of it; arrangements are made to supply steam and cold water during the operation.

Second, "the mode or modes of constructing printing apparatus "or machinery," &c.

"The inking rollers may be made in the ordinary manner," but it is preferred "to make them of gutta percha softened by an acid," and "turned in a lathe." "In making such a roller, the centre of it may be either of wood or metal."

[Printed, 6s. 7d. See *Mechanics' Magazine*, vol. 55, p. 77; and *Patent Journal*, vol. 11, p. 263.]

A.D. 1851, January 21.—N<sup>o</sup> 13,467.

SIEVIER, ROBERT WILLIAM. — "Improvements in weaving "and printing or staining textile goods or fabrics;" these are, first, forming the looped surface of looped fabrics from the weft "by means of longitudinal wires or other equivalent means in "combination with warp threads, which, by being made to "descend one after the other in rapid succession instead of simultaneously, as is usually the case with warp threads, will thereby "draw off from the quill or bobbin in the shuttle a sufficient "quantity of weft or shoot to form the loops one after the other "over the longitudinal wires."

Second, the method shewn and described, or any mere modification thereof, "for cutting the loops when a cut pile fabric is "required."

Third, "the general arrangement of the machinery or apparatus shewn and described," and also "the mode of printing or staining warps or fabrics, as described," claiming particularly "the use of plates perforated to correspond with the different shades of the pattern." These plates are by preference "made of thin metal, such as copper or brass, but thin sheets of gutta percha or other impervious material may be employed." These plates are secured by pins to "a wooden framing, and certain portions of them are cut away according to the pattern intended to be produced."

(See "Abridgments of Specifications of Patents upon Bleaching, Dyeing, and Printing.")

[Printed, 1s. 8d. See London Journal (*Newton's*), vol. 41 (*conjoined series*), p. 81; *Mechanics' Magazine*, vol. 55, p. 98; and Patent Journal, vol. 11, p. 215.]

A.D. 1851, January 28.—N° 13,474.

CROSSLEY, JOSEPH.—"Improvements in the manufacture of carpets, rugs, and other fabrics;" and these are, first, in manufacturing "Brussels and cut pile carpets and rugs" having "additional thick backs" by "throwing in additional weft so as to be taken and tied at the back by an additional warp," and so on.

Second, manufacturing carpets and other terry and cut pile fabrics in which printed warps showing defined figures are used, by the employment of flat or oval wires when weaving by power.

Third, "employing thick weft when weaving carpets with printed and party-colored warp," to "produce two similar corded surfaces, showing the same pattern on both sides of the cloth."

Fourth, "wrapping or binding with worsted or other suitable material the selvages of rugs made from printed warps and rug backs, prepared to be adhered to figured worsted by means of dissolved caoutchouc, and which are known by the name of mosaic rugs," "during the process of being woven." Extra warps may be drawn over and under the selvage warp of the fabric.

[Printed, 6d. See Repertory of Arts, vol. 18 (*enlarged series*), p. 229; *Mechanics' Magazine*, vol. 55, p. 118; and Patent Journal, vol. 11, p. 219.]

A.D. 1851, February 24.—N° 13,524.

HINKS, JOHN, and VERO, JAMES.—"Certain improvements in the manufacture of hats, caps, bonnets, and other coverings for



"the head;" and these are, first, waterproofing felt hats, &c. by applying a "solution with a brush to the under side of the brim" and the inside of the crown of the hat until the solution appears "slightly on the outside of the hat," afterwards heating in a stove.

Second, "waterproofing the bodies of felt hats, &c. to be afterwards covered with silk," &c. The hat body is placed on a block, &c., and brushed with a solution and dried, and this coating repeated five or six times, ending with a coating of the varnish commonly employed in the manufacture of hats, by which "the covering material is attached."

The "solution" mentioned above consists of india rubber in a solvent or "Macintosh's paste or varnish" mixed with oil of turpentine.

Third, "a method of waterproofing varnished or painted felt hats." The composition consists of the following substances mixed in certain proportions and in a certain manner:—Whiting or carbonate of lime, water, lamp black, turpentine, boiled linseed oil, and the "solution" mentioned above. The composition is laid on to the felt hat with a brush, when it is dried in a stove and japanned by a japan, in preference made of the following ingredients, in certain proportions:—Asphaltum, common resin or pitch, damor resin, boiled linseed oil, and the "solution" mentioned above, and turpentine. If a color is required, it is introduced into the varnish, and the black is omitted.

Fourth, "covering hats, using knitted fabrics."

[Printed, *4d.* See *Mechanics' Magazine*, vol. 55, p. 195; and *Patent Journal*, vol. 11, p. 255.]

A.D. 1851, March 4.—N<sup>o</sup> 13,542.

NEWTON, ALFRED VINCENT (*a communication by Mr. Goodyear*).—"Improvements in the preparation of materials for the production of a composition or compositions applicable to the manufacture of buttons, knife and razor handles, inkstands, door knobs, and other articles where hardness, strength, and durability are required;" and these are, first, treating caoutchouc or gutta percha, or caoutchouc and gutta percha combined, by mixing them with sulphur and heating them to a high temperature, or mixing them with sulphur and other substances and heating them. The other substances mentioned are magnesia, lime, or the carbonates or sulphates of magnesia or lime, or "calcined French chalk or

"other magnesian earth," "gum, lac, or shellac," "rosin, oxides or salts of lead or zinc of all colors, and other similar substances, both mineral and vegetable, may be added in small quantities to either of the compounds." These compounds are mixed by a masticating machine, and rolled into sheets and manufactured into the articles desired. "The compounds or compositions after heating or curing will attain a hard and stiff character resembling tortoise shell, horn, bone, ivory, or jet."

Second, applying these compositions when hardened by heating, or before heating by moulding, shaping, and afterwards heating, also uniting them to iron or other metals, &c., which will bear heat, and afterwards heating.

[Printed, 4d. See London Journal (*Newton's*), vol. 40 (*conjoined series*), p. 9; Mechanics' Magazine, vol. 55, p. 219; and Patent Journal, vol. 11, p. 276.]

A.D. 1851, March 31.—N<sup>o</sup> 13,577.

GWYNNE, JOHN.—"Improvements in machinery for pumping, forcing, and exhausting of steam, fluids, and gases, and in the adaptation thereof to producing motion, to the saturation, separation, and decomposition of substances;" and these are many, and are said to consist "of arrangements of machinery, apparatus, or means relating to the application or employment of centrifugal force for various purposes" described; and one of the improvements is said to be "employing and using centrifugal pumps formed of gutta percha or a composition thereof, or of caoutchouc."

[Printed, 3s. 11d. See Mechanics' Magazine, vol. 55, p. 290; Practical Mechanics' Journal, vol. 4, pp. 107, 121, 126, and 147; and Patent Journal, vol. 12, p. 37.]

A.D. 1851, April 15.—N<sup>o</sup> 13,590.

STONES, WILLIAM BENSON.—"Improvements in the use and treatment of peat and its products, and other carbonaceous matters, and also for apparatus applicable to such and other chemical purposes;" and one of the improvements is said to be, employing the "greases and resino-adipose wax obtained from peat, and herein denominated peacerine, adiposole, and adipolein, for currying and polishing leather, and also for strengthening it, and rendering it and other material waterproof."

(See "Abridgments of Specifications on Gas Making, &c.")

[Printed, 9d. See Repertory of Arts, vol. 19 (*enlarged series*), p. 220; Mechanics' Magazine, vol. 55, p. 338; and Patent Journal, vol. 12, p. 22.]

A.D. 1851, April 30.—N° 13,611.

WEBLEY, PHILIP.—“Improvements in the manufacture of “boots and shoes, and in rendering the said manufacture water-proof; also in the machinery and materials to be used therein;” and these are, first, in “a method of nailing or pegging the heels” of the above-named articles.

Second, “producing a new material,” which is named “compound leather.” This is effected as follows:—Scraps, &c., of leather are washed by steeping in water, dried, “dessicated,” and saturated in a solution of glue, afterwards pressed into a cake, and rasped by an arrangement of rasps described. These raspings are now steeped in hot water, and washed and dried. The dry pulp is mixed in a machine described, with gutta percha softened by heat; the substance is made “to issue by a stopcock, which has “an expanded flat mouth, and made to pass between rollers; this “completes the manufacture.”

Third, “rendering boots and shoes waterproof;” and this is effected “by employing a thin sheet of gutta percha, which mould “when warm over a last, or fac simile of the one on which the “boot or shoe is formed;” thus “shaping of the gutta percha “sole on a last.”

[Printed, 10d. See *Mechanics' Magazine*, vol. 55, p. 378; *Practical Mechanics' Journal*, vol. 4, p. 226; and *Patent Journal*, vol. 12, p. 75.]

A.D. 1851, May 3.—N° 13,612.

NEWTON, WILLIAM EDWARD (*a communication*).—“Improvements in the manufacture of woven and felted fabrics;” and these are, first, “coating or covering felt, or semifelt, or “woven fabrics with caoutchouc, or similar gums, or the compound thereof,” with a “bat or fleece of cotton, flax, silk, or “other similar substance being interposed;” and this is effected as follows:—Carded wool or fur, either, both, or mixed, is hardened by the felting process, “but not entirely felted, the degree of felting depending upon the quality of the fabric to be produced.” The bat “is then covered over with a thin bat or sliver of cotton, “flax, silk, or other similar fabrics” (the mode of laying the fibres determining the elasticity or non-elasticity of the fabric to be made), and passed through rollers, “with a glazed apron interposed in the usual way, forcing the india rubber through “between the fibres of the cotton bat or fleece until it reaches the

"surface of the under felted bat." Instead of caoutchouc in solution being used, a sheet rendered very soft by heat may be employed.

Second, coating "woven or knitted fabrics" with caoutchouc.

This is done in a similar manner to the above.

When a thick bat or fleece of cotton, &c. is used in combination with the felted woven or knitted fabrics, it receives a coating of india rubber before passing through the rollers to be combined with the other fabric as above. The combined fabrics thus formed may afterwards be submitted to the curing or vulcanizing, or not, as may be desired.

A useful fabric is produced by coating with caoutchouc, or its compounds, the fleecy side of Canton flannel, or fleecy cotton, or any fleecy fabric, "the fleecy tissue performing the part of the "plating bat or fleece described."

[Printed, 4d. See *Mechanics' Magazine*, vol. 55, p. 399; and *Patent Journal*, vol. 12, p. 75.]

A.D. 1851, May 29.—N<sup>o</sup> 13,645.

ADAMS, HENRY W.—"An improved means of generating galvanic electricity, of decomposing water or various electrolytes, of collecting hydrogen or burning it or atmospheric air separately or in combination." In carrying out the above, one part of the invention is said to consist "of a practical air holder or air supplier," made as follows:—The top and bottom are round, and made of "board or metal," then "take a belt of canvass, or duck, or leather, or some analogous flexible substance, lined with rubber inside and outside, or not, or otherwise," "and attach it firmly to the top and bottom by means of straining the said belt around the board or metal top and bottom, and then fitting on a metallic hoop over the said belt and around the edges of the top and bottom of the said air holder, which hoops "make fast to the top and bottom by means of screws which pass through the hoops and the edges of the belt, and screw into the top and bottom, and thus make the air-holder tight, &c."

(See "Abridgments of Specifications upon Gas, &c.," "Electricity, &c.")

[Printed, 1s. 2d. See *Repertory of Arts*, vol. 18 (*enlarged series*), pp. 305, 368; *Mechanics' Magazine*, vol. 55, p. 456; and *Patent Journal*, vol. 12, p. 131.]

A.D. 1851, June 12.—N° 13,660.

CHATTERTON, JOHN.—“ Certain improvements in protecting “ insulated electro-telegraphic wires, and in the methods, and “ machinery used for the purpose ;” and these are, “ protecting “ electro-telegraphic wires, when insulated, by a coating of gutta “ percha,” &c., “ by lead or other metal tubing passed or “ drawn over the same,” by passing the lead tubing, as it is formed by a hydraulic lead-pipe-making machine, of the ordinary description, over plain wire attached to the end of the core on which the lead tubing is formed, the wire passing over rollers and through a trough in which there is a stream of cold water constantly flowing, for the purpose “ of lowering the temperature of “ the tubing before bringing it into contact with the gutta “ percha insulated wire, and the final compressing of the whole “ by dies or grooved rollers.”

[Printed, 6d. See London Journal (*Newton's*), vol. 40 (*conjoined series*), p. 195; *Mechanics' Magazine*, vol. 55, p. 500, and vol. 56, p. 131; and *Patent Journal*, vol. 12, p. 135.]

A.D. 1851, June 24.—N° 13,674.

HODGES, RICHARD EDWARD, and BROCKEDON, WILLIAM.—“ Improvements in surgical instruments ;” and these are, first, “ in instruments to be introduced into passages or orifices in cases “ where it is desired that parts of the instruments may expand when within passages or orifices.” The following, or modifications thereof, are described :—A long piece of metal tubing, of the desired thickness to enter the passage, is taken, and to this is attached an end of metal (which may be either closed or open) by a flexible tube, in preference made of vulcanized india rubber, a rod or stem passing through the tube is attached to the point end, and fastened by a small chain at the other end keeps the india rubber tube extended; in this state it is introduced into the passage, and by releasing the chain the india rubber will contract in length and expand in diameter.

Second. “ In constructing and using instruments of india “ rubber to plug up gun-shot and other wounds. The most convenient form for these instruments is tubular, though solid “ plugs may be employed,” “ with a short cord or string fixed to “ each end.” “ In using such an instrument, the string or cord “ at one end of the instrument would be first passed through, and

" then by pulling out the india rubber in length it would be brought to such a diameter as readily to be drawn through the wound, when the india rubber would be allowed to expand (by slackening the pull on the strings or cords), when it would most effectually plug the wound."

Third. " In surgical instruments for relieving the bowels, urinary organs," &c. This is effected " by means of partially exhausted vessels or receivers," by preference made of gutta percha. The aperture, when first using this, is fitted to the part of the person tight by immersing it in warm water, or the orifice is covered with vulcanized india rubber. The vessel is exhausted by an air-pump. This arrangement might be applied to extract milk from cows.

[Printed, 7d. See Repertory of Arts, vol. 19 (*enlarged series*), p. 215; London Journal (*Newton's*), vol. 40 (*conjoined series*), p. 100; and Mechanics' Magazine, vol. 56, p. 17.]

A.D. 1851, August 7.—N<sup>o</sup> 13,713.

BUNN, LOCKINGTON SAINT LAURENCE.—" Improvements in the manufacture of kamptulicon;" and these are, first, applying " woven fabrics, wire gauze, perforated metals," &c., " between two layers or sheets of kamptulicon, and printing and ornamenting the same." This is effected " by causing the masticated caoutchouc, combined with cork dust or other matters," to be rolled or spread upon these materials, and afterwards printed upon, &c., or the outside can be canvas, &c., and printed, painted, &c.

Second. Manufacturing " sheets, blocks, or layers of kamptulicon, combined with pigments, on to other kamptulicon, in an uncolored state." The cork dust is dyed, or pigments are mixed with the cork dust before mixing it with the india rubber. " Blocks of kamptulicon " are coated " by the same method, using at times india-rubber solutions to unite them, in preference to heat or rollers."

Third. Manufacturing " kamptulicon into mosaic or other patterns, either for pavements," &c. This is effected as follows:—Colour " kamptulicon in the masticator by the addition of pigment or coloring matter, and while in a plastic state press or mould it into different forms;" " place the pieces so formed side by side, varying the colors to arrive at any desired pattern, using india-rubber solution, or other suitable adhesive matter, to the pieces so put together;" " cut the combined mass into

174 INDIA RUBBER AND GUTTA PERCHA:

“veneers or sheets, which use in that form,” “or cement or affix them to sheets or blocks of kamptulicon.”

[Printed, 3d. See Repertory of Arts, vol. 19 (*enlarged series*), p. 167; London Journal (*Newton's*), vol. 40 (*conjoined series*), p. 365; Mechanics' Magazine, vol. 56, p. 157; and Artizan, vol. 10, p. 66.]

A.D. 1851, August 14.—N° 13,721.

MOULTON, STEPHEN.—“Certain improvements in the preparation of gutta percha and caoutchouc, and in the application thereof;” and these are combining gutta percha alone or mixed with caoutchouc “with the acids of sulphur of a lower degree of oxygenation than sulphuric acid in combination with suitable bases,” preferring “a hyposulphite which can be used alone or combined with the salts of the acids of sulphur, or with the sulphurets,” by making a mixture of sulphite or hyposulphite of lead or of zinc, and the artificial sulphuret of lead or zinc with gutta percha, alone, or combined with caoutchouc, and submitting them to a high temperature. Also “using Paris white or chalk in the mixture;” also “combining therewith carbonate of magnesia.” These mixtures are treated in the same manner as set forth in the Specification of Patent N° 11,567.

[Printed, 3d. See London Journal (*Newton's*), vol. 40 (*conjoined series*), p. 363; Mechanics' Magazine, vol. 56, p. 158; and Artizan vol. 10, p. 66.]

A.D. 1851, September 4.—N° 13,738.

DUNCAN, JOHN WALLACE.—“Improvements in engines for applying the power of steam or other fluids for impelling purposes, and in the manufacture of appliances for transmitting motion;” “and these are,” first, “several arrangements of rotary engines.”

Second, “condensers or other apparatus for condensing steam in steam engines,” “having a combined series of tubes or other channels through which the cooling medium circulates, such tubes or channels having rotary motion, in order to present a change of cooling surfaces to the steam as it enters from the exhaust passage of the engine.”

Third, “the endless belts of gutta percha having diagonal blades constructed and adapted for transmitting motion to ships and other vessels.” These “blades are placed diagonally to the length of the belt, and consequently to its motion, so that when motion is imparted to the belt, when in the water, a side

" pressure will be exerted upon it by the blades passing through that medium."

Fourth, "the manufacture of wheels and bosses (used in machinery for preparing and spinning fibrous materials) of gutta percha and other substances, masticated and combined by machinery." The gutta percha in its native state "is cut into shreds of a fibrous character," and "submitted to a machine similar to that known as Calvert's Patent Cotton Opening or Cleaning Machine," to tease out the dirt. The gutta percha and similar analogous substances, as "catimundo," may be used alone; but a combination is described as employed, of cannel coal, gutta percha, alone, or combined with "tintowa" (jintawan), or "catimundo." These are ground in a masticator; heat is applied, and for this purpose "the gaseous products of the combustion of coke" are employed. The heat gradually increases till it rises to 350° F. The substance "discharged from the masticator may be afterwards moulded by hand, or discharged into a machine which moulds, consolidates, and discharges the bosses by self-acting machinery." Another machine described is a punch "for cutting out of blanks," screw bosses, &c. It consists of a punching press, having a screw and guide capable of being changed according to the bosses to be cut out. The cutting instrument is formed somewhat like a wad punch, but with a cutting edge and interior of the form required for the pinion or boss to be cut, that is, having the several convolutions adapted to cut the forms required."

[Printed, 2s. 4d. See *Mechanics' Magazine*, vol. 56, p. 237.]

A.D. 1851, October 9.—N° 13,765.

LILLIE, Sir JOHN SCOTT. — "Improvements in forming or covering roads, floors, doors, and other surfaces;" and these are, "combining metallic substances with coarse gravel, small pieces of stone, wood, or bricks, by means of concrete bituminous compounds, and other cements," and the modes of doing so are described; and it is stated that to "provide against the noise and other evils occasioned by the concussion of the solid metallic surfaces of carriage wheels and horseshoes on stone pavements," "cover such solid metallic surfaces of carriage wheels and horseshoes with gutta percha, asphalted felt, vulcanized india rubber, or other suitable material, studded



176 INDIA RUBBER AND GUTTA PERCHA :

“ with metallic bolts, nails, or screws, which will serve at the same  
“ time to attach such improved surfaces to the tires of the wheels,  
“ horseshoes, or hoofs.”

[Printed, 5*d*. See London Journal (*Newton's*), vol. 40 (*conjoined series*),  
p. 430; and Mechanics' Magazine, vol. 56, p. 318.]

A.D. 1851, November 19.—N<sup>o</sup> 13,819.

BESSEMER, HENRY.—“Improvements in producing ornamental  
“ surfaces on woven fabrics and leather, and rendering the same  
“ applicable to bookbinding and other uses;” these are, first,  
“ the various methods of ornamenting woven fabrics by metalliz-  
“ ing their surfaces,” as described. One of these modes, when it  
is desired to render such fabric waterproof, is to use “a thin coat-  
“ ing of gutta percha, which is to be applied to the fabric” “after  
“ the manner already practised;” pass the prepared fabric “over a  
“ heated plate,” and rub the bronze or other metallic powder “on  
“ with a piece of cotton wool” while passing over the heated  
plate.

Second. Printing or producing “on woven fabrics a series of  
“ colored lines,” &c.

Third. Ornamenting such fabrics with leather. For this pur-  
pose leather cuttings are reduced to a powder, and the fabric to be  
ornamented is first “coated with gutta percha or other pliable and  
“ adhesive matter.” “The leather flock is then applied” in the  
same manner as in flocking paper, &c. &c.

(See “Abridgments of Specifications upon Bleaching, Dyeing,  
“ and Printing.”)

[Printed, 7*d*. See Repertory of Arts, vol. 19 (*enlarged series*), p. 356; and  
Mechanics' Magazine, vol. 56, p. 436.]

A.D. 1851, December 8.—N<sup>o</sup> 13,850.

PIDDING, WILLIAM.—“Improvements in the treatment, manu-  
“ facture, and application of materials or substances for building  
“ purposes;” and these are in the combination of materials for  
the above purposes. In making “bricks, slabs, blocks, tiles,  
“ pipes, or other forms or shapes, from combinations of broken  
“ stone, scoria, muriate of alumina, or acetate thereof, mineral  
“ earths, fluxes, wood or wood dust, commonly called sawdust,  
“ coal, coke, papier maché, naphtha, vegetable fibres, pitch, glue,  
“ gutta percha, and other articles possessing the requisite proper-

“ties, by combining in combinations of several of the foregoing articles, or separately and individually with cement, either of known use or of the present invention, as herein-after explained.” “Also veneering blocks, slabs, bricks, or other forms,” “where desirable, on one or more edge, face, or end thereof, with slate, stone, marble, or other suitable substance on material of any desired thickness, and cause such veneers to adhere thereto or therewith by certain cements;” “the cements are made of burnt sulphate of alumina and burnt sulphate of lime, silica, very finely pulverized, or, if preferred, precipitated, (or where it is more convenient borate of soda may be used instead of and in the same proportion as the alumina).” “These are mixed in certain proportions and in a certain manner,” “or silica, mixed, when dry, with linseed oil or common driers, or without the latter.”

“For the purpose of obtaining solid, light, economical, and impervious substances, for building purposes generally, and for breakwaters, ships, or other vessels.”

“Combine any of the materials before mentioned with gutta percha, or with marine glue, using one article in combination therewith, or several thereof.”

[Printed, 4d. See London Journal (*Newton's*), vol. 42 (*conjoined series*), p. 110; and *Mechanics' Magazine*, vol. 56, p. 400.]

A.D. 1851, December 24.—N<sup>o</sup> 13,880.

NICKELS, CHRISTOPHER, BALL, THOMAS, and BAGLEY, JOHN WOODHOUSE.—“Improvements in the manufacture of knitted, looped, and other elastic fabrics;” and these are, first, “in machinery for making knit fabrics.”

Second, “in machinery for producing warp fabrics with transverse threads at both sides of the fabric.”

Third, “in looms suitable for weaving narrow elastic goods,” “goods containing more or less india rubber.” The improvement is in the batten, “which is suitably arranged and constructed to have two rows of reeds, those of the upper row being intermediate of those of the lower row, thus allowing of the fabrics made by each to be clear to view, and at the same time readily accessible to the weaver.” Another improvement “is so constructing and arranging the battens that two rows of shuttles may be used in such manner that each fabric may have weft thrown in at the back and front of a middle warp, which may

178 INDIA RUBBER AND GUTTA PERCHA:

" be composed more or less of india-rubber thread, such middle  
 " warp not requiring any movement up and down, the silk or  
 " other warp threads rising and descending above and below the  
 " middle warp, to open sheds for the passage of the upper and  
 " lower shuttle for making each fabric. In this arrangement or  
 " construction of batten only one reed is used for each pair of  
 " shuttles, and the shuttles are caused to move in opposite direc-  
 " tions at the same time, as both top and bottom sheds are opened  
 " at the same time. The two rows of shuttles are similar to those  
 " employed in like descriptions of looms, where only one shuttle  
 " is used to make a fabric; and the batten is made with two  
 " shuttle races or grooves, each similar to those employed in  
 " looms where only one row of shuttles is used."

Fourth, "improvements in the manufacture of elastic looped  
 " fabrics with a terry, or fleeced terry or cut pile surface;" and  
 these are applying india rubber, or a composition of the same, to  
 the front or face surface of these goods to render them water-  
 proof.

Fifth, "the covering of strands of india rubber or other  
 " material with looped knit fabrics." The machinery described  
 performs as follows:—The thread is laid around the needles; it  
 is passed under their beards. A pressing cone closes the  
 beards, and a rotating plate knocks the work over the heads of  
 the needles.

[Printed, 4s. 3d. See *Mechanics' Magazine*, vol. 57, p. 75.]

A.D. 1851, December 31.—N<sup>o</sup> 13,886.

FROGGART, ROBERT БЕК.—"Improvements in the prepara-  
 " tion of certain compounds to be used for the purpose of render-  
 " ing woven and textile fabrics, paper, leather, wood, or other  
 " materials or substances, waterproof and fireproof, and also in  
 " machinery or apparatus employed therein;" and these are, first,  
 " several combinations, compositions, or compounds of chemicals"  
 " to be used for rendering woven or textile or other fabrics or  
 " materials waterproof or fireproof, or both." These combinations  
 are, firstly, graphite prepared "by fusing about 10 parts of iron  
 " filings with 90 parts of carbon for about ten hours; secondly,  
 " animal or vegetable matter, as glue, gluten, resin, mucus, or  
 " any gummy substance," dissolved in "water in different pro-  
 " portions according to the materials or substances to be made

"waterproof;" thirdly, "blood is heated until the serum, which is a clear transparent liquid, floats on the top, and the crassamentum is precipitated; fourthly, "a strong solution of proto-sulphate of iron," exposed "to the atmosphere for some days," or the basic red sulphate of iron, double sulphate of potassa and alumina, or hydrochlorate of ammonia;" fifthly, "oxygenated oils or fatty substances." The materials to be rendered fire or water proof, or both, are treated in a certain manner with these substances one, more, or all.

Second. "The machinery or apparatus described for impregnating oils or fatty substances with oxygenated gas, and freeing such substances from impurities."

[Printed, 1s. 1d. See *Mechanics' Magazine*, vol. 57, p. 36.]

A.D. 1852, January 8.—N° 13,891.

ADDENBROOKE, JOSEPH.—"Improvements in the manufacture of envelopes, and in machinery used therein;" these are, first, "the several arrangements and means for feeding, gumming, and stamping; second, "the means and machinery for pressing over the sides of the envelopes after being creased in the folding box;" third, "the working of machinery used in the manufacture of envelopes by means of a treadle or treadles." In the machinery described for carrying out these improvements, on raising the plunger four pieces of vulcanized india-rubber tubing cause the flaps of the envelope to be inclined inwards, and when the plunger descends it "folds down the flaps in their proper order." "An endless band of gutta percha or other yielding material" receives the envelopes as they come from the machine; several rollers bear upon this endless band, some of which are covered with gutta percha, "which press the flaps down." Other rollers covered with gutta percha cause the envelope to advance towards the plunger.

(See "Abridgments of Specifications upon Paper, Pasteboard, Papier-Mâché," Part II.)

[Printed, 2s. 6d. See *Mechanics' Magazine*, vol. 57, pp. 41, 59.]

A.D. 1852, January 12.—N° 13,894.

DUTHOIT, ALCIDE MARCELLIN. — "An improved chemical combination of certain agents for obtaining a new plastic product;" and this may be made of "common oxide of zinc,

## 180 INDIA RUBBER AND GUTTA PERCHA:

"purified oxide of zinc, amianthus, fusible spar (or sulphate of barytes), and other analogous substances, with purified and "bleached gutta percha." The gutta percha is "purified and "bleached" by means of dissolving in pure naphtha, or benzole, or sulphuret of carbon. These substances are mixed singly and in different proportions with the gutta percha solution, according to the object for which they may be required. To give elasticity "for certain applications," caoutchouc is added in certain proportions. These mixtures are used in the manufacture of a great number of articles, many of which are named.

[Printed, 4d. See *Mechanics' Magazine*, vol. 57, p. 59.]

A.D. 1852, January 27.—N<sup>o</sup> 13,931.

BERNARD, JULIAN.—"Improvements in the manufacture or "production of boots and shoes, and in materials, machinery, "and apparatus connected therewith;" and these relate principally to certain mechanical arrangements for cutting, shaping, and pressing the soles of boots and shoes, paring the edges of the uppers, lasting the uppers. An apparatus for inserting plastic material into the soles of boots and shoes for securing them to the uppers; an arrangement for inserting pegs into suitable holes in the soles and heels of boots and shoes for the purpose last mentioned; an arrangement for forming pegs, securing the different parts of boots and shoes, by forcing plastic materials into suitable holes or openings for that purpose; preparing the materials to be used in the manufacture of boots and shoes for the purpose of rendering the same impervious to moisture.

In carrying out the above inventions, vulcanized india rubber is employed in parts of the machinery. The solutions employed for attaching the upper to the inner sole is composed of gutta percha, caoutchouc, shell or gum lac dissolved in naphtha, or other suitable solvent. Strips of leather for pegs are charged "with "gutta percha or chouca, rendered soluble by any known means "under pressure." In connecting the outer sole to the inner sole and uppers, holes are made in it, and these are "filled up with a "plastic or soluble material, such as gutta percha, caoutchouc," &c. The article known as Jeffereys' marine glue and chouca will answer the same purpose. In preparing leather, it is extended over a porous stone; Ransom's patent stone is preferred; and

AIR, FIRE, AND WATER PROOFING. 181

the atmosphere being withdrawn, the waterproofing composition is brushed over it.

[Printed, 2s. 5d. See *Mechanics' Magazine*, vol. 57, p. 117.]

A.D. 1852, February 2.--N° 13,951.

SPENCER, GEORGE.—“Improvements in the springs of rail-  
“way carriages, trucks, and waggons;” and these are said to  
“consist of “modes of applying vulcanized india rubber, or other  
“suitable elastic material, to the purpose of springs for railway  
“carriages, &c.,” “and in the parts and combinations thereof,  
“as applied to buffer draw and bearing springs.” The rings of  
vulcanized india rubber or other suitable material may be made of  
many forms, and “instead of making them cylindrical, as in  
“Fuller’s spring,” “making them so as to obtain a lateral resist-  
“ing power from the confining cylinder in which they are placed.”  
This object is more perfectly attained by the truncated cone shape,  
and they are either of one “or of various densities in the same  
“buffer.”

[Printed, 10d. See *Repertory of Arts*, vol. 20 (*enlarged series*), p. 236; and  
*Mechanics' Magazine*, vol. 57, p. 157.]

A.D. 1852, March 8.—N° 14,018.

HODGE, PAUL RAPSEY.—“Certain improvements in the con-  
“struction of railways and railway carriages, parts of which are  
“applicable to carriages on common roads.” One of these im-  
provements is, “arranging springs of india rubber in connexion  
“with the common spring for railway carriages, as also the springs  
“of india rubber in connection with the crosshead and links.”  
The spring has a centre rest by a pin on the axle box; and at  
each end bolts pass through the spring, and are affixed to the  
frame of the carriage. Above the spring on these bolts springs of  
india rubber are put. By substituting for the steel spring a cross  
head, an arrangement of india-rubber springs without the steel  
spring is obtained. A modification of the first spring is obtained  
by, instead of having the india-rubber springs between the frame  
and the steel spring, having them underneath the frame of the  
carriage. Another improvement is “placing an elastic medium  
“between the wheel and collars, for the purpose of preventing  
“lateral shocks on railway carriages.” In the inner faces of the

## 182 INDIA RUBBER AND GUTTA PERCHA:

two collars, and in the centre of the wheel, circular grooves are turned out, into which are placed two annular rings "made of" vulcanized india rubber as an elastic material."

[Printed, 1s. 5d. See London Journal (*Newton's*), vol. 42 (*conjoined series*), p. 120; and *Mechanics' Magazine*, vol. 57, pp. 259 and 462.]

A.D. 1852, March 20.—N° 14,027.]

**RICHARDS, WILLIAM WESTLEY.**—"Certain improvements in" fire-arms, and in the means used for discharging the same; also "improvements in projectiles." The first part of these improvements relate principally to the construction of a revolving pistol, and to constructing percussion caps and primers for discharging fire-arms. In projectiles the first improvement is, using "gutta percha, horn, wood, and other yielding materials (being non-metallic), for the construction of the cores of hollow conical projectiles;" also the insertion of hard metal rings in hollow projectiles.

Second. "The use of a mixture of gutta percha and cork in" raspings or coarse powder for the construction of waddings." The gutta percha is melted, the cork matters stirred in, and the mixture is rolled into sheets; "the waddings are cut by any" desired size of punches."

[Printed, 8½d. See *Mechanics' Magazine*, vol. 57, p. 276.]

4

A.D. 1852, March 22.—N° 14,029.

**BRADY, JOHN DRUMGOOLE.**—"Improvements in helmets, cart-ridge boxes, and other military accoutrements;" and these are first, an "improved helmet;" second, "the means of ventilating" helmets and other head pieces," and are as follows:—"For the ventilation of helmets and other head-pieces generally," "place" on the inside of such head-piece two or more thin hollow strips of metal or gutta percha, and admit the air by leaving them open at bottom, at the sides of and flush with the body of the helmet or other head-piece. At top these hollow strips are perforated or are left open. Just above the head an opening or openings must be made in the top of the head-piece for the escape of the heated air. Instead of hollow strips or tubes, pieces or strips of metal or gutta percha, with edges bent round so as to form a tube with the side of the helmet or other head,

“ piece, may be used.” “ Form improved cartridge boxes by  
“ moulding gutta percha or gutta percha composition into the  
“ required shape, and attach the felt or leather covering by heat-  
“ ing the surface of the gutta percha sufficiently to cause adhe-  
“ sion.” “ Make sword scabbards and bayonet sheaths of a  
“ foundation of gutta percha, wholly or partially covered with felt  
“ or leather, and united by heating the surface of the gutta  
“ percha.”

[Printed, 5d. See *Mechanics' Magazine*, vol. 57, p. 277.]

A.D. 1852, March 24.—N° 14,037.

ARCHER, WILLIAM.—“ An improved mode or modes of pre-  
“ venting accidents on railways.” This is effected “ by apparatus  
“ consisting of signals of various kinds, placed at convenient  
“ distances along the permanent way, which are set by mechanical  
“ arrangements forming part of the said apparatus in connexion  
“ with inclined curvilinear planes or friction wheels, acted upon  
“ by the tires of the wheels passing along the said permanent  
“ way, or by certain additions made to the engine, carriage, or  
“ moving body or bodies. The setting of these signals takes  
“ place instantaneously with the pressure of the tire of the wheel,  
“ but as soon as the vehicle has passed, one portion of” the “ appa-  
“ ratus is so arranged as to effect the unsetting of the signals in  
“ as slow a manner as the expediency of particular cases of appli-  
“ cation may necessitate.” “ By this means the engine driver of  
“ an engine following at too great a velocity a previous train is  
“ warned by the signal, if not ‘unset,’ that only a certain fixed  
“ time has elapsed since the first engine passed. These signals  
“ being set by mechanical arrangements acted upon by the flanches  
“ of the wheel of the locomotive engine, and ‘unset’ by natural  
“ means.” In carrying out the above, an air receiver, consisting  
of an arrangement of plates of iron with a flexible leather body,  
and “ admitting of a diminution or increase of its cubic contents”  
by reason of “ a series of patent galvanized india-rubber valves,”  
is described. These valves consist “ of two perfectly flat and even  
“ plates of galvanized india rubber,” through which the air in the  
receiver escapes; on the passing of the vehicle, a vacuum is pro-  
duced and the signals set, but by an arrangement by a small aper-  
ture in one of the plates of the receiver the vacuum decreases, and  
the signals gradually become unset.

[Printed, 1s. 4d. See *Mechanics' Magazine*, vol. 57, p. 299.]



A.D. 1852, April 6.—N° 14,057.

POOLE, MOSES (*a communication*).—"Improvements in covering wire for telegraphic purposes;" and these are, first, "coating of wires with a flexible varnish of bitumen, and then applying gutta percha or other insulating materials;" "also the combining india rubber or gutta percha in combination with bitumen as a flexible varnish or coating." This is effected by drawing the wire through a trough with melted bitumen before applying gutta percha or india rubber or a mixture of these materials."

Second, "the mode of applying coatings and successive coatings of gutta percha or india rubber, or of a mixture of the two." In carrying out this part of the invention an apparatus is described for covering telegraphic wire with a ribbon or fillet of india rubber, the action of which may be described as follows:—The wire to be covered is drawn off a reel, and as it leaves the reel passes between fixed studs, by which any bends or irregularities are removed, and then through the hollow axis of some pulley, after passing through which it takes off a fillet of india rubber from a bobbin, after which it takes one turn round a pulley, and from thence it is taken and wound upon a wheel or bobbin. The pullies, the hollow axes of which are spoken of, revolve and give motion to a disc affixed to the side of one of them which carries the bobbin on which the india rubber is wound. The axis on which the bobbin revolves is attached to the side of the disc by a joint, so as to be capable of fixing the bobbin at an angle to the wire. When two or more coverings of india rubber are required, the wire, as it receives one covering, is made to pass through another hollow axis, and in its passage may receive a coating of a solution of india rubber or solvent of same, so as to unite the next ribbon or fillet, &c.

Third, "the combination and use of employing two or more moulding dies or orifices to obtain successive coatings to wire." The wire is drawn through guides into a chamber containing the plastic material, and passing through a succession of different-sized dies gradually increasing in size, and which are fixed in the chamber, passes out with a succession of coatings. The material of each coating may be different "by causing the material to be forced in separate compartments in communication respectively with the several dies."

[Printed, 1s. 3d. See Repertory of Arts, vol. 21 (*enlarged series*), p. 101; Mechanics' Magazine, vol. 57, p. 318.]

A.D. 1852, April 15.—N° 14,059.

**BELTZUNG, FRANCOIS JOSEPH.** — “Improvements in the  
“ manufacture of bottles and jars of glass, clay, gutta percha, or  
“ other plastic material, and caps and stoppers for the same, and  
“ in machinery for pressing and moulding the said materials.”  
The first part of this invention relates to the manufacture of  
“ bottles and jars of glass, clay, gutta percha, or other plastic  
“ material, having screws, inscriptions, or other devices impressed  
“ on the exterior of their necks or mouths by means of sharp or  
“ angular edged dies worked by pressure.”

Second, “Or by means of a machine containing dies, guided  
“ by slides or levers, or other equivalent means, in combination  
“ with an expanding mandril, or with a conical or taper mandril,  
“ capable of being forced into the neck or mouth of the bottle or  
“ jar, and guided as herein-before described.” “Or by means of  
“ dies in combination with a punch or plunger working in a  
“ guide, as herein-before described.” “The manufacture of  
“ screw-caps or stoppers for bottles and jars of gutta percha, or  
“ other suitable plastic material, by means of dies in combination  
“ with a guided punch having a screw formed upon it.” “By  
“ stamping them out of sheet metal by means of a punch and  
“ die and a presser die, and then pressing the metal into the  
“ groove or thread of a screwed mandril,” &c. &c.

[Printed, 1s. 6d. See *Mechanics' Magazine*, vol. 57, p. 334; and *Practical Mechanics' Journal*, vol. 5, pp. 207 and 232.]

A.D. 1852, April 29.—N° 14,098.

**HINKS, JOHN. and NICOLLE, EUGENE.** — “A new or im-  
“ proved composition, or new or improved compositions, and  
“ machinery for pressing or moulding the same, which machinery  
“ is also applicable to moulding or pressing other substances.”  
First, the new compositions consist of mixtures of gutta percha  
with either farinaceous matters or with woody fibre, or both. The  
farinaceous matters preferred may consist of wheat and barley  
flour, or potato, wheat, or other starch; and the woody matters  
preferred are hemp or flax, cut short. The mixture is preferred to  
be made in certain proportions with heated rollers, and the sheets  
cut into pieces of a suitable size, especially for manufacturing  
boxes for packing steel pens or other small articles, &c.

Second, "constructing a machine for pressing or moulding" these compositions and plastic substances generally. The machine consists of an arrangement which is described; and a cake or sheet of the plastic substance to be pressed or moulded, first warmed, is placed upon a die fixed upon the top of a plunger, whilst, by the rotation of an axis, another plunger or die is made to descend upon it, and forces a portion of the plastic material between the first die and plunger, thus forming the article according to the die.

[Printed 7d. See *Mechanics' Magazine*, vol. 57, p. 395.]

A.D. 1852, May 1.—N° 14,113.

NEWTON, ALFRED VINCENT (*a communication*).—"Improve-  
ments in the manufacture of printing surfaces;" and these are,  
first, "making from flat moulds of plates (from which to take  
impressions by a cylinder press) of a substance which, when  
heated, will be sufficiently plastic to receive the required im-  
pression by moulding in a mould of the required form in  
reverse, and when cooled will be sufficiently hard to give the  
required impressions in a cylinder press, and admit of being  
bent around and fitted to a cylinder," and the application of  
such plates or printing surfaces to the cylinders of cylinder  
printing machines."

Second, "making by casting in moulds or by pressure plates  
with raised characters or figures, the entire substance of such  
plates being sufficiently elastic to adapt it to printing on hard  
or irregular surfaces."

The substance to receive, when heated, the desired impression  
is a mixture of "two to three parts of gutta percha, or from two  
to three parts of india rubber or caoutchouc, and from one to  
three parts of finely pulverized graphite or soapstone, or plaster  
of Paris, or per-oxide of manganese." This is pressed into a  
mould, which may be of the same material, "having the impres-  
sions in reverse of those intended to be produced," "and per-  
mitted to cool," and "bent around a cylinder." After such  
plates are worn out the substance can be softened again, and  
remoulded.

The substance which has been tried "with success for the purpose  
of printing upon hard, irregular surfaces is a compound consisting  
of the best kind of coopers' glue, as it is known in the arts, and

"molasses." This mixture is poured into the moulds in a liquid state, and on cooling is taken out of the moulds.

[Printed, 4d. See London Journal (*Newton's*), vol. 42 (*conjoined series*), p. 280.]

A.D. 1852, May 22.—N° 14,130.

ROBERTS, RICHARD.—"Certain improvements in and applicable to boats, ships, and other vessels." These improvements are very numerous, relating to nearly every part of a vessel; and one is "the improved application of caoutchouc or other suitable material to the vents of vessels." This is effected as follows:—  
"A grate having a convex surface, over which is gently stretched a piece of sheet caoutchouc equal in width to the height of the grate, which, with the caoutchouc, is secured in an aperture in the vessel's hull. These vents, whether they are applied to waterclosets or to carry water from the deck or other place, should, when practicable, be placed low enough to give a head of fluid equal to two or three feet, that the weight of the column may overcome the tension of the caoutchouc, which should be sufficient to prevent the ingress of water or air."

[Printed, 3s. 3d. See *Mechanics' Magazine*, vol. 57, p. 437.]

A.D. 1852, May 22.—N° 14,133.

RUSSELL, JOHN JAMES.—"Improvements in coating metal tubes;" and these are, "coating iron tubes with gutta percha or gutta percha combined with other materials." The solution of gutta percha alone is preferred to be used, "and having rubbed the surfaces of the tubes clean, which are to be coated, apply the coating by means of a brush, or, in place thereof, and when only the exterior surface of a tube is to be coated, stop the two ends, and immerse the tube in or pass it through a bath of a solution of gutta percha, by which a coating of the same will be obtained, and repeat such coatings till the thickness of gutta percha desired" is obtained.

[Printed, 3d. See *Repertory of Arts*, vol. 20 (*enlarged series*), p. 365; and *Mechanics' Magazine*, vol. 57, p. 436.]

A.D. 1852, May 29.—N° 14,145.

LEESE, JOSEPH, the younger.—"An improved system of preparing, cutting and engraving rollers to be used for printing woven

## 188 INDIA RUBBER AND GUTTA PERCHA:

"and other fabrics, and improved machinery for printing and washing the same fabrics." In carrying out one part of this invention, it is said to be, "to produce rollers of metal suitable for surface printing, and in inlaying felt or other suitable flexible material in those parts of the surface which are to be printed from," and it is stated that, the best mode of doing this is "to spread gutta percha over one side of a piece of felt, and then to warm the roller, and to press the pieces of coated felt, of the form of the cavities or hollows, into them," and then "remove any portion of the felt which may protrude out beyond the true circumference of the roller by means of a sharp knife," &c. &c.

(See "Abridgments of Specifications of Patents upon Bleaching, Dyeing, and Printing.")

[Printed, 7d. See Repertory of Arts, vol. 21 (*enlarged series*), p. 88; *Mechanics' Magazine*, vol. 57, p. 477.]

A.D. 1852, June 12.—N<sup>o</sup> 14,165.

DIXON, EDWYN JOHN JEFFREY, and DODSON, ARTHUR JOHN.—"Improvements in machinery and apparatus used in quarrying slate and stone, and in cutting, dressing, planing, framing, and otherwise working and treating slate and stone, and in apparatus and waggons used for moving and conveying slate and stone, and improvements in joining, framing, and connecting slate and stone." In the machinery used as above india-rubber bands, rollers, and buffers are employed, and the following are among the improvements, first, "connecting slabs of slate or stone for roofs of houses, the flooring of cisterns, &c., or in any situation where a water-tight joint is required," by applying "thin strips of sheet gutta percha or of indian rubber placed in a rebate or groove instead of the white lead, or putty, or other similar plastic substances or compounds now employed."

Second, applying "gutta percha or of india rubber, or other substances combined with either or both of these, to the making of frames for writing or school slates, pressed while in a plastic state into moulds with any pattern, device, letters, or figures, that the counterpart may be impressed upon the frames. To place the slate in these frames, prevent the joining of one corner while in the mould by a fillet in the mitre, and afterwards unite

"the joint by heat." "And applying gutta percha, or india rubber, or leather, or other suitable substances in connexion with wood in the formation of the framing for writing or school slates." Instead of making mortices in two of the pieces and tenons in the others of the four pieces which compose the frame, make open "mortices" in all the four pieces intended for the frame. Into two of these pieces glue or otherwise fasten small pieces of gutta percha, india rubber, or other suitable substances to form what in carpentry is termed 'a false tenon,' these again fit into the mortices in the other two pieces of timber for the framing, and the frame is fastened by metallic or other pins in the corners. In 'mitreing' slate frames (instead of mortice and tenon) use the same materials for the 'tongue' as for the 'false tenon,' and cap the corners of the frames with an angular capsule or clamp of gutta percha or india rubber, or other proper substance or substances set on with cement."

[Printed, 4s. 6d. See *Mechanics' Magazine*, vol. 57, p. 516.]

A.D. 1852, June 21.—N° 14,175.

BURGESS, WILLIAM.—"Improvements in the manufacture of gutta percha tubing;" and these are, "manufacturing gutta percha tubes made with corrugations so as to render them flexible." "The gutta percha tube intended to be corrugated is placed on a metal mandril, upon which is formed a worm or screw of the form it is intended to give the corrugations," such mandrils having necks or axes at the ends." "A tape is warped round the outside of the tube from end to end in order to keep it in form when heat is applied to soften it, having previously applied soft soap to the exterior of the tube to prevent the tape adhering;" "enclose the tube by applying an external metal casing made in two halves, so as readily to be placed over the tube on the mandril, such case leaving a space between it and the tube all round, and allow steam to flow into such case till the tube of gutta percha has become softened and will admit of being pressed into the corrugations or screw-form of the mandril within." Then remove the case, "and cause the tube to take the corrugated form by winding a cord on the outer surface of the tube, progressively unwinding the tape before the cord is wound on." "A cord or strip of vulcanized india rubber which, by reason of its elasticity and softness, is peculiarly

190 INDIA RUBBER AND GUTTA PERCHA:

" suitable for pressing the warm tubing of gutta percha into the  
 " hollows of the mandril, thus forming the corrugations is pre-  
 " ferred, and when the tube is nearly cold withdraw the mandril  
 " by unscrewing it from the tube."

[Printed, 3d. See *Repertory of Arts*, vol. 21 (*enlarged series*), p. 108; and  
*Mechanics' Magazine*, vol. 58, p. 17.]

A.D. 1852, June 28.—N° 14,193.

COLEMAN, JAMES EDWARD (*a communication*).—" Improve-  
 " ments in the application of india rubber and gutta percha, and  
 " of compounds thereof;" and these are,—

First, " the general arrangement and construction of several  
 " forms of buffers, springs, and elastic or deadening connections."

Second, " the system or mode of arranging and constructing  
 " buffers, springs, and other elastic or deadening connections."

Third, " the system or mode of constructing buffers and springs,  
 " with hollow elastic india-rubber or other cylinders, containing  
 " air, or air and water, or other fluid."

Fourth, " the system or mode of constructing drawsprings or  
 " elastic connexions, with solid elastic cylinders or blocks."

Fifth, " the application of india rubber, or other elastic cylin-  
 " ders or blocks, to adjustable or right and left screw draw  
 " links."

Sixth, " the system or mode of constructing draw links, wherein  
 " the elastic action is entirely within the links."

Seventh, " the system or mode of constructing elastic draw  
 " links, by combining elastic cylinders or blocks with right and  
 " left screw spindles."

Eighth, " the application and use of a secondary elastic cylinder  
 " for the obtaining of a non-recoil action."

Ninth, " the application and use of elastic cylinders or blocks  
 " within the horn plates or axle guides of railway and other  
 " carriages."

Tenth, " the application and use of solid elastic blocks or cylin-  
 " ders, as bearing springs, wherein the axial lines of vertical elastic  
 " action are coincident, or in the same plane with the horn plates  
 " or side guides."

Eleventh, " the application and use of elastic cushions in steam  
 " engines, for easing the working of the piston and crank action,  
 " and for returning the piston at each stroke."

Twelfth, "the application and use of elastic or india-rubber layers on the exterior of the brasses or bearing of machinery."

Thirteenth, "the system or mode of constructing railway wheels with a layer of india rubber or elastic material interposed between the exterior of the rim and the interior of the tyre."

Fourteenth, "the system or mode of laying the rails of railways with interposed layers of india rubber, or other elastic material."

Fifteenth, "the system or mode of preventing the jarring of carriage windows and doors, by the interposition of elastic side pieces."

Sixteenth, "the system or mode of connecting rigid details of machinery, by the interposition of elastic matters for the prevention of jarring."

[Printed, 1s. 5d. See *Mechanics' Magazine*, vol. 58, p. 54; and *Practical Mechanics' Journal*, vol. 5, pp. 154 and 170.]

A.D. 1852, July 6.—N° 14,205.

LEMOIN, JULES.—"An improved composition applicable to the purposes of varnish to the waterproofing of fabrics, to the manufacture of transparent fabrics, to the fixing of colours, and other useful purposes."

[No Specification enrolled.]

A.D. 1852, July 6.—N° 14,207.

GAULLIÉ, ALFRED.—"An improved plastic composition, applicable to manufacturing purposes;" and this is made by "combining gutta percha, in the raw state, with Roman cement, by means of animal gall," forming "a plastic material, capable of being stamped, moulded, and receiving all the different shades of coloration." The gutta percha is liquified by heat in an iron pot, and in this state Roman cement, made pasty by ox gall, or gall of other animals, is mixed with it. Colours, reduced to a paste, by means of gall, may be incorporated with it.

[Printed, 3s. See *Mechanics' Magazine*, vol. 58, p. 55.]

A.D. 1852, July 15.—N° 14,221.

POOLE, MOSES (*a communication*).—"Improvements in boots shoes, clogs, and other similar articles;" and these are, com-



## 192 INDIA RUBBER AND GUTTA PERCHA:

binning materials in manufacturing these articles in the manner described. These articles have two soles, an inner and an outer. The inner sole is perforated with many holes, for the purpose of ventilating the foot when walking, and is separated from the outer by many strips or bars of vulcanized india rubber. The outer sole is fixed to the inner by any convenient means, or made of any suitable material; however it is preferred to be made of india rubber, suitably prepared for making a hard substance resembling whalebone. The "upper" "may be of any suitable material," but if connected with the india rubber before the same is heated, a fabric capable of bearing such heat must be employed. All the parts of a shoe, &c., "may be put together before the process of vulcanization, or portions may be vulcanized and put together with cement, sewing, &c."

Ventilation to the foot may be obtained at the heel, and provided with a plug to close it in wet weather.

[Printed, 5d. See Repertory of Arts, vol. 21 (*enlarged series*). p. 147; and Mechanics' Magazine, vol. 53, p. 97.]

A.D. 1852, July 20.—N° 14,230.

RIDER, EMERY (*a communication*).—"Improvements in the manufacture or treatment of india rubber and gutta percha, and the application thereof;" and these are, first, preparing "gutta percha by preliminary heating," so "that the volatile and oleaginous fluids" are "expelled." This is preferred to be done "by means of hot metal rollers," or "in a stove heated by steam or hot air."

Second, "producing a new material, permanently elastic, not liable to be affected by any change or degree of temperature." After preparing the gutta percha as above, it is, "either alone, or in combination with caoutchouc, mixed with the well-known ingredients," cured or vulcanized. Hyposulphate of lead or zinc is preferred.

[Printed, 3d. See Mechanics' Magazine, vol. 53, p. 116.]

A.D. 1852, August 19.—N° 14,268.

CLOUGH, CHARLES BUTLER.—"Certain improvements in machinery or apparatus applicable to the purposes of brushing and cleaning;" and one of these improvements is, "employing gutta percha, leather, india rubber, or other elastic substance,

“ to form, when required, the whole or any part of such brushes, “ and the whole or any part of the” “ rollers.” The brushes are cylindrical, and are made to rotate by means of machinery. These brushes may be used for many purposes.

[Printed, 6d. See *Mechanics' Magazine*, vol. 58, p. 190.]

A.D. 1852, September 10.—N° 14,287.

BERNARD, JULIAN.—“ Improvements in the manufacture or “ production of boots and shoes, and in materials, machinery, and “ apparatus connected therewith;” and these are, first, “ arrangements and combinations for lasting the uppers upon boots and “ shoes.” These are said to be improvements upon the same, described in the Specification of Patent, N° 13,931.

Second, a mode of “ piercing or screwing holes in the soles of “ boots and shoes, and inserting and moulding plastic materials “ into suitable holes made for that purpose.” In the machinery the “ spindles which pierce the holes have their lower extremities “ formed into screws,” “ instead of being plain or smooth, for the “ purpose of cutting or forming a helical groove or channel in “ the holes previously formed by the spindles or piercers, so that “ the plastic material will assume the form of a screw, according “ to the formation of the hole made.” The plastic materials are in a box with a steam jacket. Holes are in the box, but covered with slides. When these slides are withdrawn from the holes, a bag in the interior of the box, inflated with water or steam, presses out the plastic materials into corresponding holes formed in the soles and upper of the boot or shoe placed to receive them. By an arrangement the air has been withdrawn from the holes previously. The bed is attached by somewhat similar arrangements of machinery, &c.

Third, “ stitching or ornamenting the soles of boots.”

Fourth, “ waterproofing and strengthening the uppers.” “ A piece of leather is selected and shaped and split; insert a lining, “ which may be of leather, &c. waterproofed by a solution of “ caoutchouc, &c., and united or otherwise to the leather.”

Fifth, “ mechanical arrangements for stitching and uniting “ materials.”

[Printed, 5s. See *Mechanics' Magazine*, vol. 58, p. 255.]

194 INDIA RUBBER AND GUTTA PERCHA :

A.D. 1852, September 18.—N° 14,299.

POOLE, MOSES (*a communication by Mr. Goodyear*).—"Improve-  
ments in combining caoutchouc and other matters;" and these  
are, "combining of a product of coal tar, caoutchouc, and sulphur,  
"and subjecting the same to heat;" and it is stated that no claim  
is made "to the application of heat to caoutchouc combined with  
"sulphur, when the product of coal tar described, or of the vege-  
"table or mineral pitch, is not combined therewith." "The  
"product of coal tar or of vegetable or mineral pitch" "is  
"obtained by boiling the coal tar (which is produced in the manu-  
"facture of coal gas) for two and a half to three hours, or until it  
"is little less hard than resin, and about the consistency of Bur-  
"gundy pitch." "This product of coal tar may be used in large  
"proportions with caoutchouc, and thus produce an extensive  
"saving in the production of what is known as vulcanized india  
"rubber, as well also in the production of hard substances in the  
"character of horn and whalebone; and such manufactures may  
"have combined therewith white lead and coloring matters."  
"This compound is applied to many purposes in a similar  
"manner to the india rubber and sulphur compound."

[Printed, 3d. See Repertory of Arts, vol. 21 (*enlarged series*), p. 233; and  
Mechanics' Magazine, vol. 58, p. 277.]

A.D. 1852, September 30.—N° 14,306.

POOLE, MOSES (*a communication by Mr. Goodyear*).—"Improve-  
ment in the manufacture of combs;" and these are manufacturing  
"combs by the application of the hard substance of a tortoiseshell  
"or ivory-like texture, produced by combining sulphur and india  
"rubber, and subjecting them to heat." The material, it is said,  
is described, under Patent N° 13,542. The sheets hardened by  
heat, the combs are cut out of them "in like manner to that pur-  
"sued in making combs from sheets of horn, as is well under-  
"stood." The hard substance is improved by rolling when it is  
at a temperature of 300° Fahrenheit, or it may be stamped by  
pressure between metal dies, "so as to give an ornamental charac-  
"ter as well as mark out the comb;" or combs may be cut out of  
sheets before heating, and afterwards changed by heating. To  
give the substance "a tortoiseshell or ivory-like texture, it is found  
"desirable gradually to raise the temperature," and retain it at  
a certain temperature during given periods or lengths of time.

[Printed, 3d. See Mechanics' Magazine, vol. 58, p. 297.]

A.D. 1852, November 7.—N° 14,348.

**POOLE, MOSES** (*a communication by Mr. Goodyear*).—"Improve-  
ments in the elastic ribs, sticks, and fillets used in the manufac-  
ture of umbrellas and parasols, and various other articles, in  
substitution of whalebone and steel heretofore employed;" and  
these are, manufacturing "of elastic ribs, sticks, and fillets used in  
the manufacture of umbrellas and parasols, and various other  
articles (in substitution of whalebone and steel heretofore em-  
ployed), from hard and elastic substances produced by com-  
bining india rubber and sulphur, and subjecting the same to  
the requisite heat;" employing a composition, such as is  
described in the Specification of Patent N° 13,542. Besides the  
articles mentioned above, "elastic springs of corsets and other  
parts of dresses, and other articles" may be made. A descrip-  
tion of the manufacture is given; and it is stated that it is pre-  
ferred, in manufacturing some of the articles, to employ the  
material already hardened, while with others they are made out  
of the plastic materials, and hardened afterwards.

[Printed, 3d.]

A.D. 1852, December 17.—N° 14,352.

**SHAW, GEORGE** (*a communication*).—"Certain improved  
machinery for making envelopes and bags." This invention  
consists, first, in the preparation and application "of adhesive  
material" "to the feeding or transferring means used in the  
manufacture of envelopes and paper bags." Pieces of india  
rubber are immersed in turpentine, set fire to, and burned "until  
the india rubber is partially melted," when, wipe the surface with  
paper "until the paper, although still tending to adhere, comes away  
clean." India rubber thus prepared is fixed upon the feeder of an  
envelope folding or gumming machine. Such a machine was de-  
scribed in the Specification of a Patent granted to A. F. Rémond,  
February 28, 1849, N° 12,493. (See "Abridgments of Specifications  
upon Paper, Pasteboard, Papier Mâché," Part II.) Second, the  
application of flexible creasing by means of a cylindrical form  
in combination with a suitably formed plunger." The flexible  
surfaces consist "of prepared or vulcanized india rubber, in the  
form of tubes upon axes capable of revolving in bearings;" the  
plunger, somewhat larger than the space filled with the revolving  
tubes, descends "and causes the blank to be creased by pressing

**196 INDIA RUBBER AND GUTTA PERCHA :**

“ into the flexible surfaces of the cylinders.” “The paper thus  
“ creased ” is received “into a suitable receiver below.”

(See “Abridgments of Specifications upon Paper, Pasteboard,  
“ Papier Mâché,” Part II.)

[Printed, 5d.]

---

PATENT LAW AMENDMENT ACT, 1852.

1852.

A.D. 1852, October 1.—N° 6.

POOLE, MOSES (*a communication from Mr. Goodyear.*) —  
 “Improvements in the manufacture of guns and pistols;” and  
 these are “the application of the hard substance of a whalebone  
 “or ivory texture in the manufacture of parts of guns and pistols,”  
 as described. The hard substance is “india rubber combined  
 “with sulphur, with or without other materials,” compounded  
 together in certain proportions, “though colouring and other  
 “matters may be combined as described in the Specifications of  
 “other patents granted” to the patentee “on behalf of the same  
 “inventor.” “In making the stock of a gun or pistol it may be  
 “made solid or hollow; if hollow, then it is preferred to line the  
 “interior with rough sheet iron of the form of the stock; if solid,  
 “then it is preferred to make the interior of a cheaper compound  
 “made of the materials before named, or of wood roughly formed to  
 “or approaching the desired shape; the plastic material being laid  
 “on in sheets or other pieces all over the exterior, and then pressed  
 “between dies to make the surfaces take the exact shape desired.  
 “The wood for this purpose should be well steamed and dried,  
 “in order to prepare it for undergoing the heat to which it will  
 “be subjected in converting the compound of india rubber and  
 “sulphur into the hard substance of a whalebone or ivory-like  
 “texture.” “The parts of the lock and other furniture are to be  
 “coated all over with very thin sheets of the material,” “and  
 “thus they will be protected and preserved from rust.”

A.D. 1852, October 1.—N° 10.

ROE, FREEMAN.—“Improvements in valves and cocks;” and  
 these are, *first*, a “moveable spindle, as described, in connexion

198 INDIA RUBBER AND GUTTA PERCHA:

" with a ball-valve." A ball, to which is attached a spindle, is placed in a pipe supplying water to a cock. This spindle is depressed or elevated by an arm extending from another ball which is floating in the cistern supplied by water from the cock resting upon it. On the water being drawn out of the cistern the ball descends; the arm presses upon the spindle, and depressing the ball in the tube, allows the water to flow until the ball in the cistern rises, and its arm no longer pressing upon the spindle, the ball in the tube rises to the top of the tube, where it presses upon a seat of vulcanized india rubber, and shuts out the passage of the water into the cock.

Second, "arranging valves or cocks for supplying water-closets or other vessels with a measured quantity of water."

Third, "forming dove-tail grooves or narrow openings in the working parts of valves or hydrants" for fixing "the seats of the valves, and casting or fixing therein gutta percha or metal of a different kind to the body of the valve," so "that the gutta percha or metal will produce a fixed working surface."

[Printed, 54d.]

A.D. 1852, October 1.—N° 11.

GRAY, THOMAS WOOD.—"Improvements in cocks and valves;" and these are, applying "spherical glass, china, earthen, or such like ware valves, in combination with vulcanized india-rubber or other elastic seatings arranged to be kept closed by the pressure of the fluids," &c. The sphere, made of whatever it may be, is in the interior of what is called the valve chamber. The valve chamber is fixed to the main by screws, &c. The water presses the sphere against the seat of the valve, which may be of vulcanized india rubber or other suitable elastic material. On the top of the valve chamber is a box, into which, by an arrangement of screws, a stand pipe may be fixed. The valve in the valve chamber may be depressed by means of a spindle passing down through the stand pipe, and thus allow the water to flow from the stand pipe.

[Printed, 54d.]

A.D. 1852, October 1.—N° 16.

POOLE, MOSES (*a communication from Mr. Goodyear*).—"Improvements in the manufacture of telescopes and other tubes;"

and these are, "applying a hard substance, of a whalebone or "ivory-like texture, produced from india rubber combined with "sulphur and subjected to heat." The rubber is mixed with sulphur or substances which will give off sulphur by heat in certain proportions, and this may be mixed "with other matters, "such as gum lac, gutta percha, pitch, and coal tar, deprived of "water by heat; white lead, oxide of zinc, or other colouring "matters, may be used, and even others in like manner to that "which has before been described and practised under other "patents, and to which separately no claim is here made." "In "making such tubes the compounded materials are first made "into sheets, and then introduced and retained in metal or "plaster moulds during the process of heat, taking care that the "edges come closely together or overlap, to insure a good joint, "or, where the material is of sufficient substance, it may be simply bent into a tube-like form, and the mould dispensed with;" "or a mandril may be used, the sheet or material enclosing it at "all parts, and the edges caused to overlap, or otherwise, to "insure a good joint." "In using a mandril, it is first covered "with paper to facilitate its delivery after the heating process." "This substance will be found very useful, amongst many "other purposes, for receiving and insulating wires for electric "telegraphs."

[Printed 2½d.]

A.D. 1852, October 1.—N° 19.

POOLE, MOSES (*a communication from Mr. Goodyear*).—"Improvements in moulding articles when india rubber, combined "with other materials, are employed;" and these are, "the mode" described "of moulding articles made of india rubber (either "with or without other matters) combined with sulphur;" and it is stated that hard articles, "both moulded and otherwise, have "been made" of such compounds, and heat applied, and this according to N° 13,542, but the following mode of moulding has not been adopted:—The combined india rubber is rolled into sheets; these sheets are pressed upon the moulds, and the cores filled up with "sand or other fine granular matter," and in this way "subjected to heat, in any convenient manner, for about six "hours."

[Printed 2½d.]



A.D. 1852, October 1.—N° 24.

POOLE, MOSES (*a communication from Mr. Goodyear*).—"Improvements in the making covers for and in binding books and portfolios, and in making frames for pictures and glasses;" and these are, first, applying "the hard substance of a whalebone or ivory-like texture produced by combining india rubber and sulphur, and subjecting the same to heat, to the making of the covers of books and portfolios, and to the making of frames for pictures and glasses;" second, connecting "the leaves of books together with india rubber combined with sulphur, and converting or vulcanizing the same by heat."

The india-rubber compound is rolled into thin sheets, which are placed on thick paperboard or strong woven fabric," "the india rubber being turned over at the edges, according to the size and character of the book or portfolio, or the covers and back are made wholly of sheets of the compounded materials, by using thicker sheets of the compound, with fibre or woven fabric adhering to the inner surfaces, and having shaped them, they may be pressed into a mould to obtain the desired device or character; and the process of heat may be conducted whilst the compound is between the surfaces of the moulds, or" otherwise, "then producing the device by pressure between dies or engraved surfaces." "The hinges are produced by vulcanized india rubber alone, applied to the surfaces of a woven fabric." In the second part of the invention the leaves of the book at the back "are roughened and coated with india-rubber cement containing sulphur for producing vulcanization." "Straps of woven fabric may be applied at intervals, extending across the hinge for the purpose of strengthening the back and hinge of the book," and heat "till the change called vulcanization is produced, which will generally result in about fifteen minutes by applying heat of about 265° Fahrenheit by a metal or other surface." "In making the frames for pictures and glasses," the compounds above described "are either used "as veneers, after the sheets are vulcanized, to cover the surfaces of wood frames, or else mould them solid to the design or device desired."

[Printed, 3½d.]

A.D. 1852, October 1.—N° 27.

MACINTOSH, JOHN.—“Improvements in packing for steam engines and other machinery.”—*Void by reason of notice to proceed not having been given within the time prescribed by the Act.*—And these are, “making and using a composition in the following manner:”—“Cuttings of vulcanized india rubber or gutta percha (or it may be the materials of which such manufactures are composed) are burned, and produce a black and partially fluid product, which is mixed with charcoal, black lead, and lampblack.”

[Printed, 2½d.]

A.D. 1852, October 1.—N° 28.

POOLE, MOSES (*a communication from Mr. Goodyear*).—“Improvements in coating metal and other substances with a material not hitherto used for such purposes;” and these are, first, “coating the exterior surfaces of rods, tubes, and wire, and cords or bands, by enclosing them within the compounded materials” mentioned, “so that the edges of the material overlap, or the articles are otherwise closed over, in all parts of their exterior surfaces, with the hard substance;” also, “coating of other hollow articles of metal, such as insulating instruments, with such material.”

Second. “The hard substance” is “produced by combining india rubber with sulphur, with or without other materials, and applying to metal or other surfaces, and then subjecting them to a high degree of heat till the desired result is obtained.” A thin sheet or fillet of india rubber, mixed with sulphur, is wound round the exterior surface of the article, taking care that the edges of the thin sheet or fillet overlap slightly, or the sheet of the material may simply be such as just to cover the outer surface of the article and overlap its edges.” “In cases of coating wire of considerable length, the compound material may be applied by means of forcing it when in a plastic state through dies, as is now done in covering wire with gutta percha, and as is well understood; and the compound may contain a large proportion of pitch or coal tar, deprived of water.”

[Printed, 2½d.]

A.D. 1852, October 1.—N° 30.

POOLE, MOSES (*a communication from Mr. Goodyear*).—"Improvements in the manufacture of trunks, cartouch and other boxes, knapsacks, pistol holsters, dressing, writing, and other cases, and sword and other sheaths;" and these are, employing, in manufacturing the above articles, "a material not hitherto used in such manufactures, and which is a hard substance, produced by combining india rubber with sulphur, with or without other materials, and subjecting the same to heat after it has been made into the desired articles," "the compound to be used being rolled into sheets;" the sheets are "formed into the articles above mentioned, by spreading" them "upon forms or in moulds, according to the shape and nature of the article, more particularly where the article is to be wholly of the composition. Wood or sheet metal are considered best for forms, and solid metal is considered best for moulds," "to keep the covering in contact with the form, and, to facilitate the heating, the articles are placed in cases or frames, and surrounded with impalpable powder of talc or soap-stone, when the sheets are in the interior of a mould or shape sand is placed in the interior, and heat is" applied gradually."

[Printed, 2½d.]

A.D. 1852, October 1.—N° 33.

POOLE, MOSES (*a communication from Mr. Goodyear*).—"Improvements in the manufacture of pails, tubs, baths, buckets, measures, drinking and other vessels, basins, pitchers, and jugs, by the application of a material not hitherto used in such manufactures;" and these are, applying "a compound substance and process of moulding" in manufacturing these articles. The compound substance is "india rubber combined with sulphur, with or without other materials, and then subjecting them to a degree of heat, till the materials are converted;" and for the purpose of making the lighter articles above mentioned it is preferred that the composition should simply consist of india rubber and sulphur, as other materials, except they be coloring matters, only tend to injure the composition for such finer purposes." "In making the articles above mentioned the composition is made into sheets, and suitable sheet metal moulds are used for the purpose, which are to be lined

“ with the sheets, taking care that the edges are well brought together, and in order that the composition may retain its form within the mould, sand, or other fine heavy material is to be filled in. The moulds, with the articles therein, are then to be heated (to convert the compounded materials into a hard substance); for this purpose the heat should be raised gradually.” “ It may be stated that in many large articles it is desirable, in place of the composition only, to employ the composition between surfaces of woven fabric; and in order to give strength and stiffness to the upper or other parts, hoops of metal may with advantage be applied, in which cases such hoops are to be covered over with the substance and incorporated therein, so as to form one with the vessel to which such hoop or hoops may be applied.”

[Printed, 24d.]

A.D. 1852, October 1.—N° 37.

POOLE, MOSES (*a communication from Mr. Goodyear*).—“ Improvements in covering and sheathing surfaces with a material not hitherto used for such purposes;” and these are, the manufacture of sheets for covering and sheathing surfaces from a compound of india rubber and sulphur, with or without other matters. “ The same is to be rolled into sheets of the dimensions desired, and when the sheets are not large enough for the purposes desired, different breadths are cemented together in the usual way before heating.” “ The compound may be connected to a fabric or fleece which will bear the heat.” The heat is applied “ gradually, say to 230° of F. in about half an hour, retaining that heat for about one and a half hours, and then increasing it gradually up to 295° to 305° F. in the remainder of six hours.” “ Where the compound contains a considerable quantity of foreign matter the heat may be raised more quickly.” “ If very tough sheets are desired, then the heat is stopped from rising up to 295°.” “ These sheets, like sheets of metal, may be nailed, or fixed by screws, and form an excellent covering to a roof, a ship’s bottom, or other surface, and such sheets may be reduced in thickness, and extended (when not combined with fabrics) by subjecting them to pressure between hard and smooth rollers, the substance being at a temperature about 300° Fahrenheit when rolled.”

[Printed, 24d.]

A.D. 1852, October 1.—N° 43.

POOLE, MOSES (*a communication from Mr. Goodyear*).—"Improvements in harness and in horse and carriage furniture;" and these are, manufacturing the above articles, in the manner described, "of india rubber combined with sulphur, with or without other matters." In the Specification of Patent N° 13,542, the hard material herein mentioned was described to be used in combination with articles of metal in making parts of harness and parts of carriages, such as saddle-trees, terrets, bits, stirrups, martingale rings, and dasher irons. "Now this invention consists of employing this hard material in making various articles where no metal is used, or where metal is only used as an accessory or furniture to the article so made." "As much as may be to dispense with the use of metal and leather, when making those parts which have heretofore been of metal, or of metal and leather combined, and to substitute the substance above mentioned." "In making the parts of harness and carriage furniture," "the substance or compounded material may be made very tough and leatherlike by not carrying the heat beyond 290° to 293° of Fahrenheit; but where the compounded materials are intended to be" a "substitute for iron or metal, then the heat is to be raised from 295° to 305° of Fahrenheit; but if largely composed of foreign matters the heat may be raised more quickly."

[Printed, 2½d.]

A.D. 1852, October 1.—N° 59.

DAVIS, MARCUS.—"Certain improvements in the manufacture of carriages, carts, military and other waggons, and wheels for locomotive and other purposes;" these improvements are chiefly with a view to obtain an article which shall combine lightness with strength and durability, by the hollowness of the material employed." "Hollow iron or other metal tubes" are employed, and one relates to "the making of the wheels to traverse silently," by placing over the "outer iron or metal tubular band" of the wheel, another "tube of sulphurized or vulcanized india rubber or caoutchouc, leather, or gutta percha, in one piece, forming a circle, or, in segments, to form a circle from the stock as a centre; or, pass on to the iron tubular band a number of annular india-rubber rings, to cause the wheels to

“ traverse the road silently, and prevent the wear in the iron  
“ tubular band; or, for economy, apply a tube over the iron  
“ band, made partly of sulphurized or vulcanized india rubber  
“ and partly of canvass, cloth, pasteboard, or such substance.”

[Printed, 8½d.]

A.D. 1852, October 1.—N° 61.

BAYLIS, JOHN.—“ Improvements in hat-bands and armlets.”—  
*This invention did not proceed to the Great Seal.*—“ These im-  
“ provements consist in manufacturing elastic crape or areöphane  
“ hat-bands and armlets, which will allow of such bands and  
“ armlets being stretched over the larger part of a hat or of the  
“ arm, and at the same time will insure their fitting with great  
“ nicety and neatness the part intended for them,” as follows:—  
—“ Take a foundation (of or about the breadth of the intended  
“ band) of cloth or other suitable fabric, waterproofed or not, as  
“ required, and insert between the two ends thereof a piece of  
“ caoutchouc of sufficient length to allow of the amount of elas-  
“ ticity required. The crape or areöphane is then fastened at one  
“ end to the foundation, while the other end of the crape or  
“ areöphane overlaps that end so fastened, and allows of the  
“ attached end sliding in or out of the lap, according to the  
“ elongation or contraction of the foundation. The lateral edges  
“ of the crape are turned down over the edges of the foundation,  
“ and are fastened to it on the inside by gum, cement, or stitch-  
“ ing. Instead of caoutchouc, any other spring might be used,  
“ but not with so beneficial an effect.”

[Printed, 2½d.]

A.D. 1852, October 1.—N° 97.

DUNLOP, JOHN MACMILLAN.—“ Improvements in the manu-  
“ facture of wheels for carriages;” and these are, “ the combina-  
“ tion of rings made of vulcanized or any other compound of  
“ india rubber with decarbonized or annealed cast-iron tyres,” as  
described. The mode described is as follows:—The tyre is cast  
with a groove to admit the rubber, &c., which is kept in its place  
by pins passing through and projecting beyond the vulcanized  
india rubber, and entering into the recessed part of a groove  
cast in the tyre.

[Printed, 4½d.]

206 INDIA RUBBER AND GUTTA PERCHA:

A.D. 1852, October 1.—N° 116.

DAVIS, WILLIAM BOLIVAR.—“Improvements in ships buoys, “ life buoys, ships fenders, and other similar articles;” and these are, first, constructing the above-named articles “ of a framework “ composed of basket or wicker work, inside which are placed air “ vessels, cork shavings, or other buoyant materials, which are “ thereby protected.” The air vessels are to be made of water-proof cloth, and protected by wicker-work, and “ the wicker-work “ is covered over externally by waterproof cloth or canvas or other “ impervious material,” and “ covered with cords,” for the purpose of being easily laid hold of when thrown to persons in the water.

Second, “ the construction of life-belts or swimming belts of “ cane, or short tubes made of metal, papier mâché, india rubber, “ gutta percha, or other suitable material, secured between a “ canvas or other covering, and further protected by a water- “ proof outer covering.” These short tubes, of whatever they “ may be made, before enclosing them, as stated, have “ their “ ends sealed up by means of some waterproof cement, for the “ purpose of excluding the water, and thereby rendering them “ buoyant.”

[Printed, 8½d.]

A.D. 1852, October 1.—N° 126.

BELL, GEORGE.—“Improvements in saturating canvas, and “ other fabrics, in order to render them buoyant and waterproof.” —*This invention is void by reason of notice to proceed not having been given within the time prescribed by the Act.*—These improvements are, “using india rubber or gutta percha burnt or “ decomposed by heat for saturating canvas and other fabrics for “ rendering them buoyant and waterproof.”

[Printed, 2½d.]

A.D. 1852, October 2.—N° 156.

BROWN, JOSEPH.—“Improvements in beds, sofas, chairs, and “ other articles of furniture, to render them more suitable for “ travelling and other purposes;” and these are said to be further improvements in the invention contained in Specification of Patent N° 7799.

In suspending beds, &c. on board ship, when they are "required to counteract both the "pitch" and the "roll of a vessel. "with the greatest ease and precision possible," springs "are "connected" "at or near the corners or other convenient part "of the bed, sofa, &c., secured either to the roof or the floor of "the cabin or other place where the same is used." "An "improved single-action bed, sofa, &c." is constructed by attaching the aforesaid springs to the corners or other parts thereof, "the said bed, &c. being hung on two centres only as heretofore, but below the centre of gravity in such bed, &c." This single action, however, will not compensate for both the "pitch" and "roll of the vessel, but for one of them only." The springs are of india rubber or other suitable elastic material.

[Printed, 10½d.]

A.D. 1852, October 2.—N° 163.

POOLE, MOSES (*a communication from Mr. Goodyear*).—"Improvements in the manufacture of tables, sofas, bedsteads, "stands, chairs, and other articles of furniture, and the frames "and bodies of musical instruments;" and these are, the application of the hard substances produced from india rubber and sulphur by heat to the manufacture of the above articles. This compound is used alone or mixed with other substances.

"In constructing these articles," "when the furniture is made "of iron, it is necessary to use the sheets of composition before "being heated. The articles, either in parts or in whole, are "wound and covered over in like manner to gun barrels and "other articles described in the Specification of a former Patent." "They are then heated in the usual manner in contact with "impalpable talc or soap-stone, and not in moulds. Many "articles of furniture, and many parts of articles, may be made "wholly of the compound, being made hollow, or partly hollow, "in form of shells, and filled in with wood, or strengthened in "the interior by braces of iron."

[Printed, 2½d.]

A.D. 1852, October 2.—N° 168.

MACINTOSH, JOHN.—"Improvements in compositions to be "used as paints;" and these are, "using india rubber decom-



208 INDIA RUBBER AND GUTTA PERCHA:

“ posed by heat in combination with oils or fatty matters saponified by metallic salts, and using lime for thickening the paint or liquid produced;” “ and this may be effected ” “ by suspending the same before a fire, and ” “ causing the substance to decompose and run in a fluid state into a suitable receiver below, or it may be decomposed by heat in a vessel. The fluid thus obtained is to be combined with metallic soap, and thickened with lime, and the same may be colored by the use of pigments.” “ This paint ” “ is not liable to crack or blister in hot climates.”

[Printed, 2½d.]

A.D. 1852, October 2.—N° 170.

ALLPORT, EDWARD.—“ An improvement in the manufacture of buttons by making them with elastic shanks;” and these are, first, “ in the application of an elastic material to form the shank of the button known as “ florentine ” or covered button,” as follows:—“ The various parts of the button having been prepared in the usual manner,” “ with the exception of the canvas for the shank,” “ introduce in its place and in the same manner elastic webbing having india rubber woven in the fabric, and known as “ elastic twist webb,” and “ make up the button in the usual way.”

Second, in the application of an elastic shank or centre to “ the double-shell sewn-through button.” Two metal shells “ are prepared, similar to those used for common shell buttons, but having a circular hole punched in the centre of each; a piece of the above-named “ elastic twist webb,” “ or any other suitable elastic material, is then introduced between the shells, and the whole firmly pressed together.”

Third, “ the application of elastic shanks to covered-back buttons, is carried out as follows:—Two shells having been prepared in the usual way, a circular hole is punched through the middle of the one intended for the back shell; a flange is then turned up round this aperture. The material intended to cover this back shell has also a hole punched through the centre corresponding with the form of the back shell, and a portion of the material is then turned back and drawn through the shell slightly beyond the flange. A ring or stay eyelet is then placed over the flange inside, clipping the material, and the edges

AIR, FIRE, AND WATER PROOFING. 209

“secured by being pressed firmly together in an eyelet press.”  
“The button is then put together in the same manner as the  
“florentine or covered button, the ‘elastic twist webb’ being  
“introduced to produce the elastic tuft shank by the ordinary  
“mode of forming tuft shanks.”

[Printed, 2½d.]

A.D. 1852, October 5.—Nº 224.

HOUSTON, JOHN.—“Improvements in metallic spring packings  
“for pistons.”—*This invention is void by reason of notice to  
proceed not having been given within the time prescribed by the  
Act.*—These improvements are, “rings constructed of suitable  
“metal cast, and afterwards turned, so that at one point of the  
“circle the substance shall be thicker than the rest, and gradually  
“diminish to the opposite point, at which a small portion of the  
“ring shall be cut out, and a piece of india rubber or other  
“proper elastic substance fitted to the opening, thus allowing  
“the ring to be pressed into a small circumference, and return  
“again, by the elasticity of the spring, into its original form when  
“the pressure is removed.”

[Printed, 2½d.]

A.D. 1852, October 5.—Nº 242.

MACKENZIE, WILLIAM, and BLAIR, GEORGE.—“Improve-  
“ments in the arrangement and construction of graduated scales  
“for measuring instruments;” and these are, first, applying  
and using “elastic substances in the construction of graduated  
“scales.”

Second, “the system or mode of securing accuracy in thermo-  
“metrical and other indications by proportioning the breadth and  
“strength of the elastic scale materials to the deviation of the  
“indicating tube.”

Third, “the mode of printing” such scales.

Fourth, “the application and use of graduated imprinting sur-  
“faces of varying lengths of degrees to correspond to the known  
“expansion of the various indicating fluids.” Two fixed points,  
“as the freezing and boiling points, being determined and marked  
“upon the tube, the elastic scale may be stretched to bring the  
“freezing and boiling marks thereon to correspond exactly with

## 210 INDIA RUBBER AND GUTTA PERCHA :

" the tube marks." "The caoutchouc or other elastic material which is employed is or may be bleached, dyed, or colored in order to contrast strongly with the ink or colour of the index points as well as with the mercury or other fluid in the thermometer tube. The sheets of the elastic material are cut or shaped into slips or bands of such a form that when extended they shall expand equally in every part." "These slips or bands of elastic material, when thus prepared and cut to the necessary dimensions, are each fixed in an adjusting frame fitted with sliding holders, so that the material may be drawn out or extended and kept in the required state of extension when the scale is printed or marked upon the stretched surface, either from types or an engraved plate, or block, or other arrangement." "This system" answers for the obtainment of correct indications from a spirit thermometer, the plate being formed so as to make allowance for the known irregularities of the spirit expansion."

[Printed, 8½d.]

A.D. 1852, October 6.—Nº 253.

DE BERGUE, CHARLES.—"Certain improvements in machinery for punching metals, and for rivetting together metallic plates or bars." In these improvements, relating to the above purpose, one is "the mode of accelerating the descent of an hammer or ram" by "springs or strips of india rubber," as described. At the top of the column on which the ram is mounted is a washer, and somewhat below this is a flange on the column; between the two, strips of india rubber of suitable strength are placed, and fixed to the washer and the flange. When the ram is elevated by the force and adhesion of the friction pullies, the flange is elevated at the same time, the strips of india rubber "will be elongated by being bent," "and when the friction pullies are withdrawn the force of their contraction will give an increased velocity to the ram or hammer, and thus a blow of greater force."

[Printed, 6½d.]

A.D. 1852, October 6.—Nº 260.

FULLER, WILLIAM COLES, and KNEVITT, GEORGE MORRIS.  
—"Certain improvements in applying indian rubber or other

“ similarly elastic substance as springs for carriages ;” and these are as follows :—First, “ in keeping the axle of a carriage in its proper position by means of upright bolts acting as axle guards, on which an india-rubber ring or rings work as a spring, the bolts being made to pass through sockets of wrought or cast iron or hard wood, which are firmly bolted or secured to the axle or axle bed.”

Second, “ in keeping the axle in its proper position by means of a front stay iron, working in a lug or scroll iron, and a tie rod behind working in a similar scroll iron ; the india rubber being applied to work on a perpendicular bolt or bolts.”

Third, “ in keeping the axle in its proper position by means of an elliptical bow or stay iron with double tie rods and a joint or joints in the centre ; the india-rubber rings being applied perpendicularly, as aforesaid.”

Fourth, “ in keeping the axle of the fore carriage in its proper position, by means of four or more upright bolts, on which the india-rubber rings work as aforesaid.”

Fifth, “ a jointed lever spring with the india-rubber rings placed horizontally over the axle.”

Sixth, “ a jointed lever spring, with the india-rubber rings placed horizontally below the axle.”

Seventh, “ a jointed lever spring having compensating power with the india-rubber rings placed horizontally above the axle.”

Eighth, “ a jointed lever spring, with the india-rubber rings placed perpendicularly above the lever.”

Ninth, “ an improved lever spring, with the india-rubber rings placed perpendicularly below the lever.”

Tenth, “ an improved check spring consisting of one or more rings of india rubber with iron guides, to be used in combination with steel springs or other side springs.”

Eleventh, “ an improved elastic shackle, with one or more india-rubber rings to be used in combination with steel springs or stay irons.”

Twelfth, “ an improved suspension spring consisting of india-rubber bands, to be used separately or combined with the iron-work described as the *first*, *second*, and *third* improvements, for the purpose of securing the axle in its proper position.”

[Printed, 94d.]

## 212 INDIA RUBBER AND GUTTA PERCHA :

A.D. 1852, October 7.—N° 282.

**BLAIR, JOHN.**—"Certain improvements in the manufacture of " waddings, and in the machinery for making the same." Before describing these improvements a wadding is described, which is made according to the Specification of a Patent granted to Fontaine Moreau, 28th February 1846, N° 11,115, and also to the Specification of a Patent granted to Edward Westhead, 3rd March 1849, N° 12502. The first improvement in this invention is, in place of using a number of carding engines, using a large drum or cylinder covered with felt, and "staked upon a shaft which revolves in brass steps or sockets," and placed in front and close to the doffer of the carding engine. The drum is to be proportionably large, according to the length of the web required. "The drum " being covered with felt, the cotton as it leaves the carding " engine will adhere with such tenacity that a lap of unlimited " thickness can be produced." The lap is taken off the drum by a rod and spread upon a table of a particular construction to be sized, &c. In place of the drum two creepers may be used.

Second, introducing "silk into waddings in any manner, either made entirely from silk, or from a union of silk with any other material.

Third, "drying of waddings between steam chests, and the " application of india rubber for the purpose of waterproofing " the waddings." This is effected in manner given for one mode of sizing and drying, but instead of size, "a thin solution of india " rubber and turpentine or naptha" is used.

[Printed, 4½d.]

A.D. 1852, October 7.—N° 289.

**TATHAM, JOHN, and CHEETHAM, DAVID.**—"Improvements " in rollers or bosses used for drawing or conveying textile mate- " rials and fabrics;" and these are, first, "the adaptation of cork " to rollers or bosses," to be used as above. The rollers "con- " structed by any of the usual methods and the cork thus applied in " one or more layers, in segments," &c., "after which a covering of " flannel or other cloth, gutta percha, leather, varnish," &c. "may " be applied, if desired," or the following mode is preferred,—metal rollers "are coated with a thin film of fine sawdust applied" with some adhesive "substance," "after which a layer of sheet

"cork is wound upon the surface and caused to adhere by shellac varnish," and covered as before, or otherwise.

Second, "constructing rollers for the above purposes by the application of gutta percha covered with cloth, leather," &c. The gutta percha may be drawn on to rollers as a tube, or lapped upon them and covered. Also "covering a roller or boss to which gutta percha is applied with a layer or layers of cork."

[Printed, 2½d.]

A.D. 1852, October 7.—N<sup>o</sup> 297.

KENT, ALFRED.—"Improvements in glazing;" and these are as follows:—To secure two sheets of glass, two screws pass upwards through a grooved rafter between two sheets of glass, so placed apart as to admit of these screws passing; a fillet or plate, with two corresponding holes, is placed over these screws, and is fastened by nuts upon the screws. "The plates of glass are bedded on felt, vulcanized india rubber, or other soft elastic material." By a repetition of these arrangements, additional sheets are fixed without "putty or cement."

[Printed, 4½d.]

A.D. 1852, October 8.—N<sup>o</sup> 305.

TYLER, JOHN TALBOT.—"Improvements in hats, and in the preparation of plush or other covering used in the manufacture of hats;" and these are, coating with a solution of caoutchouc the "outer surface of the body of a hat," or the "inner surface or back of the plush or other covering for the bodies of hats," or both "and causing the same to adhere by means of a heated iron, or other equivalent;" second, preparing plush or other hat covering "by coating the back or inside thereof with the water-proof composition."

[Printed, 2½d.]

A.D. 1852, October 9.—N<sup>o</sup> 311.

BELLFORD AUGUSTE EDOUARD LORADOUX (*a communication*).—"Improvements in apparatus for manufacturing soda water and other aerated liquids;" and these relate to articles known as gasogenes, a description of one of which is given; and one of the improvements is said to be placing a small india-rubber tube,

214 INDIA RUBBER AND GUTTA PERCHA:

instead of "the spiral spring used in other aerating apparatus to keep the valve closed." The valve opens a passage for the liquid or gas to pass out from the apparatus. Another improvement is said to be, the mode of closing the apparatus, whether applied to this or to all kinds of aerating apparatus. This is effected by an arrangement of a collar and clamps with "an india-rubber washer which loops over the thickness of the bottle," in order to connect the cover of the bottle with the collar.

[Printed, 7½d.]

A.D. 1852, October 9.—N° 313.

EGAN, JOHN. — "A self-acting flax scutching and hackling machine, with horizontal blades or hackles, an incline plane on which flax holders move, the application of the fan by a current of air to press flax against scutching blades or hackles and spring-catch flax holders, as per drawing." One part of this invention consists in the use and application to the above machines of "supply belts and spring-catch flax-holding belts formed of gutta percha, vulcanized india rubber or caoutchouc, or other suitable elastic material moving on inclined planes." These belts are of gutta percha, and are endless, "and have endless strips or bands of vulcanized india rubber or caoutchouc securely affixed thereto by any of the known means." The object is, that there are grooves and recesses formed, or narrow strips raised in or on the gutta percha bands, for the purpose of ensuring a firmer grip of the flax, and thereby to hold it firmly during the operation of the scutching blades thereon."

[Printed, 1s. 1½d.]

A.D. 1852, October 12.—N° 342.

MICHEL, FRANÇOIS ALEXANDRE VICTOR. — "Stereotyping in copper by the galvanoplasty." — *This invention is void by reason of notice to proceed not having been given within the time prescribed by the Act.* — It is said to be "reproducing the engravings in general which are employed in the typography." This is executed, first, "in working the model in copper on one of the aforesaid objects; 2ly, with gutta percha; 3ly, with wax; 4ly, with all materials fit to retain a stamp; 5ly, at last,

" in reproducing with these various models the objects employed  
" to be stamped."

[Printed, 2½d.]

A.D. 1852, October 12.—N° 343.

COUCHMAN, JOHN WILLIAM.—"The closing and hanging of  
" swing and other doors by means of the spring and pivots."—  
*This invention is void by reason of notice to proceed not having  
been given within the time prescribed by the Act.*—"The spring  
" consists of vulcanized india rubber," varying in its dimensions  
proportioned to that of the door "on which it is to act." "This  
" is applied by four plates of brass or iron and two screws with  
" shifting heads," one "plate to act as guide plate, and to be fixed  
" on the edge of the hanging style of the door," "the other, to  
" which one end of the india rubber is attached, to be secured"  
to the hanging jamb, each to "let in flush with the surface  
" of the wood, so that when the door is closed they may be face  
" to face;" and the other plates are arranged in a somewhat  
similar manner. The pivots are attached one on the top of the  
door, and the other works "in a conical-shaped cup fixed to  
" the bottom of the door."

[Printed, 2½d.]

A.D. 1852, October 12.—N° 344.

PERKES, SAMUEL.—"Improvements in certain apparatus and  
" machines for the production and treatment of mineral and  
" other substances, and part of which are applicable for other  
" useful purposes." The apparatus and machines are as follows :  
—A boring bar, a crushing hammer, an improved construction of  
Chilian mill, dressing or sifting machines, a mixing vessel, amal-  
gamators, washing, &c. machines, crushing, &c. apparatus, cradles  
for washing ores, and a sublimating vessel; and it is stated that  
the whole of these "apparatuses and machines" are constructed  
of suitable materials; and in certain portions thereof are used  
" either iron, wood, glass, leather, gutta percha, and vulcanized  
" india rubber, or both combined, or copper or brass, or either or  
" any part of either of the aforesaid materials, or other suitable  
" substances not herein enumerated."

[Printed, 11½d.]



216 INDIA RUBBER AND GUTTA PERCHA :

A.D. 1852, October 12.—N° 345.

PERKES, SAMUEL.—“Certain improvements in navigable vessels and propellers.”—*This invention is void by reason of notice to proceed not having been given within the time prescribed by the Act.*—These improvements are various, relating to the hulls, sails, engines, paddles, &c. of ships, also lighting and heating the same. Among these improvements it is proposed to “enamel and vitrify iron or copper or other material, and use the same, or plain copper metal sheathing only for external sheathing, and bed the entire in gutta percha or pitch, or other suitable matter, whilst in a plastic state,” and “the application of gutta percha or vulcanized india rubber, or both combined, for a water-tight bedding and caulking for timbers, &c. on board ship, and in the construction of the foregoing and ordinary vessels” is claimed.

[Printed, 3½d.]

A.D. 1852, October 12.—N° 353.

LACEY, THOMAS.—“Improvements in apparatus for raising liquids, and in joints for uniting india-rubber and other like flexible tubing;” and these are, first, raising “liquids by means of a vessel fitted with a flexible diaphragm, in which a descending column of liquid acting upon such diaphragm raises or displaces the liquid on the upper or reverse side.” The descending column of liquid “waste water” is discharged under the flexible diaphragm, “which it will raise, and force up the water above it in the vessel” “to nearly about the level of the vessel from which the waste water was discharged.” Arrangements by a pulley, two-way cocks, &c. are made for obtaining a supply of clean water into the vessel above the diaphragm, and at the same time the discharge of “waste water” from under the diaphragm.

Second, “raising the contents of casks, barrels, and other vessels by means of a pressure of water, steam, or air acting on a flexible diaphragm.” The diaphragm is fixed about the centre of the cask, &c. When the cask is filled the diaphragm is expanded against the end of the cask, &c. An orifice is provided behind the diaphragm for the pressure of water, &c.

Third, “employing an india-rubber tube in vessels for raising liquids as a substitute for an ordinary piston and stuffing box.”

In the first improvement, "a vulcanized india-rubber tube" is described as "connected at one end to the diaphragm," "and at the other end to a tube," while a cord or chain connected to the "centre of the diaphragm passes in the second tube" over a pulley. "The rise of the diaphragm and the retraction of the vulcanized india-rubber tube puts the pully in motion," &c.

Fourth, "uniting india-rubber and other flexible tubing," as described. "One collar is placed upon each of the ends to be joined. The ends are then brought over the conical part of the body, and screwed thereto." Glass, gutta percha, &c. may be placed in the body. Where india rubber, &c. is to be united to a metal tube, employing "one collar only," and connecting the body of the joint on which the screw thread is formed to the "metal tube."

[Printed, 7½d.]

A.D. 1852, October 12.—N° 355.

WARREN, PETER.—"An improved material, applicable to many purposes for which papier-maché and gutta percha have been or may be used." Straw, of any fibrous substance, is cut into short lengths, passed through crushing rollers, in some cases using water, and afterwards boiled "in a strong alkaline lye or solution of caustic alkali, such as soda, potash, &c." "until a pulpy mass is produced;" pass it through a rag engine, and partially dry the pulp, in which state it is "rolled or pressed into sheets, or moulded into other forms, and oiled and baked. Pigments may be introduced into the pulp in the rag engine. Pulp from rags may be combined with the pulp above."

[Printed, 2½d.]

A.D. 1852, October 12.—N° 357.

DAFT, THOMAS BARNABAS.—"Improvements in inland conveyance;" and these are, "constructing railways of wood, suitable for sledges, preferring that the width between the rails should not exceed two feet six inches. The carriages are to be sledges suitably arranged, to be propelled by steam, and connected into a train, and are to be made to carry at most two passengers on each seat. The under surfaces of the carriages are to be shod

## 218 INDIA RUBBER AND GUTTA PERCHA:

“ with ” (glass skates,) “ or other hard substance, and provision is “ to be made for supplying water to the surface of the rails. The “ propelling carriage is to be made with a single wheel, with “ projecting teeth on its periphery to take into ” an “ open fixed “ rack; ” “ and the tire of such wheel is covered with vulcanized “ india rubber of about one inch thick, firmly attached to a metal “ hoop of about three quarters of an inch thick by four inches “ wide, and made in its diameter to fit the periphery to the “ engine wheel, to which it is secured by screw pins passing “ from the inside of the felloe or tire of the wheel.” “ When “ the rails are laid angularly, then the tires of the engine wheels “ are made to correspond, and the vulcanized india rubber put on “ to the shape accordingly.”

[Printed, 5½d.]

A.D. 1852, October 12.—N° 359.

GODEFROY, LÉON.—“ Improvements in covering or packing “ rollers for printing fabrics; ” and these are, attaching “ an elas- “ tic and waterproof covering ” “ to the pressure rollers used for “ printing fabrics,” and also “ the manufacture of the elastic “ fabric ” so employed. The elastic fabric is “ composed of felt “ attached to calico or woven fabric by means of india rubber.” “ When more elasticity is required two of these compound fabrics “ may be cemented together with india rubber or other cement.” The compound fabric with which the roller is to be covered is now coated on the felt side with paste or glue. The metal having first been coated with varnish, and when dry rubbed well with garlic, “ the garlic causes the paste or glue to adhere to the “ varnish.” “ The two ends of the fabric are now strongly “ drawn together, and are cut straight with a knife, and straight “ edge; the whole is then wound round in a spiral direction “ with a band of calico, and the roller is left in this state for “ twenty-four hours, when the external band is removed and the “ roller is again left to dry.” “ Or, in place of permanently “ attaching the elastic fabric above described to the roller, it will “ frequently be found convenient to use it (when printing fabrics) “ in the form of an endless band or travelling apron passing “ round the printing roller to give the elasticity required.”

[Printed, 2½d.]

A.D. 1852, October 13.—N° 361.

OATES, JOSEPH PIMLOTT.—“An improved spring or improved “ springs for carriages.” The material employed is vulcanized india rubber, and the springs are usually constructed “ of a series “ of perforated discs or washers of caoutchouc placed side by side, “ or short concentric tubes placed within one another, or a combination of both.” “The spring is mounted upon two axles, “ and circular plates are fixed on the ends of the axles to keep “ the rings of caoutchouc in their places on the said axles.” “ When the springs are used for carriages, the body ” is “ hung “ on the lower axis, and the upper axis is attached to the frame “ of the carriage.” In applying these springs to the buffers of railway carriages, the buffer rods pass through a cross bar of wood fixed, and are attached to another bar, not fixed, parallel “ with the first. Between these bars the springs are placed, and to each the springs are fixed. On the buffer rods being driven, the bars separate and elongate the rubber springs.

“The essence, in the application of these springs, consists in “ obtaining elasticity by the extension of the said springs or “ bands instead of by the compression.”

Compound springs are formed in a somewhat similar manner. A modification of the above consists in placing within the iron link, which connects the body and springs of a carriage, “a lining “ or ring of caoutchouc;” or, instead of lining the link, “put “ caoutchouc rings ” “ round the pins.”

[Printed, 54d.]

A.D. 1852, October 13.—N° 378.

LUMB, PRESTON.—“Improvements in apparatus for cleansing “ coal;” and these are, “in cleansing coal in a particular apparatus.” This may be described :—A hollow beam is supported upon a pillar; at each end of this beam are rods and handles so as to move it upwards or downwards. On each side of the pillar, about a third of the distance of the arm of the beam, is suspended a box, the bottom of which is composed of iron rods or bars, over which is placed a sheet of wire cloth or perforated metal. In these boxes the coals are placed, and these boxes are made to ascend and descend in water contained in outer vessels or cylinders placed underneath them, and into which they are directed by guide rods

220 INDIA RUBBER AND GUTTA PERCHA:

by moving the beam by means of the rod and handles. "The beam is made hollow, so as to allow a ball of metal to traverse from end to end of the beam, and act as a counterpoise to the boxes" "when in or out of the water." "In each of the two ends of the beam is placed a cushion of india rubber," &c., "to serve as a buffer to receive the concussion of the ball in its traverse from end to end of the beam."

[Printed, 5½d.]

A.D. 1852, October 14.—N° 384.

TUCK, JOSEPH HENRY.—"Improvements in stuffing boxes, and in packing to be used in stuffing boxes, bearings, pistons, and valves;" and these are, "instead of using hemp or metal packing as heretofore, construct a packing composed partly of yielding and partly of rigid substances; the elastic part of the packing is, by preference, composed of rolls or folds of canvas coated with india rubber; and in the tubes or ribs of this stuffing" "sometimes insert strands or blocks of india rubber." The hard substances which "are used in conjunction therewith are segmental, or other suitably-shaped, pieces of wood or metal, which are intended to lie or work in contact with the metallic surface, whether moving or stationary (as the case may be) against which the packing is intended to bear, the segmental or other shaped pieces being kept up to the rubbing surface by the elastic pressure of the yielding substance. In order the better to insure the proper action of this substance in glands or stuffing boxes, give the interior of the gland a conical form, or insert in the stuffing box a conical filling piece, which will answer the same purpose. By this means the pressure downwards of the gland or cover of the box will ensure the proper binding of the packing around the piston rod." "Sometimes also turn a half round annular groove in the gland or stuffing box to act as a second oil cup, and thereby prevent the waste of the oil."

[Printed, 1s. 0½d.]

A.D. 1852, October 16.—N° 419.

JOHNSON, JOHN HENRY (a communication).—"Improvements in the manufacture and applications of hyposulphite and similar

"compounds of zinc;" and these are, first, "the systems or modes" of producing the hyposulphite and bisulphuret of zinc." These are a solution of caustic potash or soda, and to which sulphur has been added, is evaporated to concentration and saturated with sulphurous acid gas, a hyposulphite of the alkali is thus obtained; when cool, this solution is added to a solution of salt of zinc, acetate preferred, a precipitate falls, "which may be called" the hyposulphite of zinc." When the saturation with the sulphurous acid gas is dispensed with the precipitate "may be" termed bi-sulphuret of zinc." Either of these precipitates are collected on a filter, dried, and "reduced to an impalpable" powder."

Second, "the system or mode of treating caoutchouc, by incorporating or combining with it" the substances prepared as above. These are well worked up together, "and subjected to" a temperature of from 120° to 150° centigrade," "and from" three to five hours."

[Printed, *3½d.*]

A.D. 1852, October 20.—N° 459.

HARRISON, CHARLES WEIGHTMAN, and HARRISON, JOSEPH JOHN.—"Improvements in protecting insulated telegraphic" wires;" and these are, first, protecting "insulated telegraph" wires by coating or covering them with a composition," which is caoutchouc dissolved in naphtha, and to which may be added creosote; these are mixed in certain proportions, and afterwards incorporated with a certain weight of shell-lac; it "may be applied" while warm to coat the gutta percha or other insulator."

Second, "by coating or covering them spirally with strips or" ribbons of caoutchouc in combination with the protecting composition." "Wires so protected may be laid in metal or earthenware pipes or channels," but it is preferred to protect them with "a leaden tube, as described in the Specification of Patent N° 13,660.

Third, "protecting of submarine telegraph wires by means of" galvanized iron wire," in the following manner, namely, "by" winding spirally over and around "one or more wires," "several" strips, ribbons, or plates of galvanized iron, each of which forms "separately the segment of a circle, and the whole when united" form a complete and uninterstitial line."

[Printed, *5½d.*]

A.D. 1852, October 22.—N° 484.

ELLINS, GEORGE.—“An improved method and apparatus for “dressing and cleaning flax straw.” The apparatus, which is described fully, consists of, first, “flexible flaxholders formed “of light frames of wood, and of “vulcanized india-rubber bands “formed into small rings to run on the sides of the frame, and a “large central ring to hold the flax straw.” Second, a skeleton table frame made of wood with ribs, “on the top of which are “bands of india rubber,” “with teeth of wood or metal of different sizes and shapes fixed into them. Third, a roller consisting “of radial fixed ribs,” “between which, moveable radial teeth of “wood or metal are suspended by caoutchouc lines or threads.” The flax or straw held by the first apparatus is laid on the table described in the second, the roller last described “is laid there- “upon, and passed backwards and forwards several times.” “As “the flax is thus in no case pressed between two fixed surfaces “during the action of the roller, there is little risk of the fibres “being fractured.” Instead of operating upon the flax by rollers, a beater, by hand or otherwise, is employed, and modifications of the table, &c. may be employed. The beaters are made of wood and india rubber, and other tables and rollers made of wood and india rubber are employed. After such treatment the flax or straw, still held by its holder, is “attached with it to a rotating “elastic corrugated frame of wood and india rubber, and as the “frame rotates, the flax, &c. is manipulated upon by a workman “with a knife,” and which consists of one or more laths of wood, and in this manner “the separation of the refuse matters from the “flax straw is completed.”

[Printed, 6½d.]

A.D. 1852, October 23.—N° 500.

COOLEY, ARNOLD JAMES.—“Improvements in the manufacture of artificial leather;” and these are as follows:—Gutta percha, or any like substances, alone or mixed, is reduced to fragments; the purer parts are selected and heated in a vessel alone or mixed with “oil of turpentine, pyrogenous oil of turpentine, “rectified mineral or coal naphtha, bitumen, benzole, bisulphuret “of carbon, pine oil, resin oil, caoutchoucine, or any similar sol-

“ vents or liquids, either singly or in mixtures of two or more,” and passed through strainers. This gutta percha, previously prepared “ under any of the now existing patents,” is made into a paste “ and kept heated, and agitated and mixed with “ from 25 to “ 400 per cent. more or less ” of “ carbonate or sesqui-carbonate “ of soda, Scotch soda, soda ash, common culinary salt, or chloride of sodium, or of any other salt or salts or saline matter “ freely soluble in water, or of powdered carbonate or sesqui-carbonate of ammonia, or of any other like substance freely “ soluble in water, and volatilizable by a moderate heat; or of “ powdered sugar, gum, British gum, or roasted starch, or of any “ other like saccharine or gummy substance or substances freely “ soluble in water ;” “ mix the said saline matters, salts, gums, “ or sugars, either one, or mixtures of two or more of them, with “ the before described purified and softened gutta percha, or “ other hydrocarbons or materials, by means of pounding, stirring, or grinding together in any suitable or convenient vessel “ or apparatus, either alone or with the addition thereto, as may “ be required, of from fifteen to fifty per cent. of the above-mentioned oils.” “ To increase the capacity of the said composition “ to resist heat and to harden the same,” “ add to the prepared dough or paste, before the addition of the powdered saline, “ saccharine, or gummy substances,” “ asphaltum or solid bitumen or shell-lac ; and when ” it is desired “ to render it “ more elastic or flexible,” “ add caoutchouc thereto, previously “ dissolved or reduced to a dough or paste by means of heat “ and the addition of the essential oils,” “ or, instead thereof,” “ add powdered sulphate of baryta, or heavy spar hydrate of lime “ or slaked lime, finely powdered caustic or quick lime, calcined “ magnesia, or carbonate of magnesia, sulphate of lead, sulphuret “ of lead or hyposulphite of lead, any one, or a mixture of any “ two or more of these substances to the before-described dough “ or paste; and promote admixture and union of the said combined materials, by exposing the same to a heat of from one “ hundred and eighty degrees to three hundred degrees (more or “ less).” “ For certain purposes wool, (perfectly carded without “ oil,) or of carded cotton, silk, flax, hemp, &c.,” “ wool dust, “ cotton dust or refuse, saw dust, wood dust, cork dust, raspings “ or cuttings of cork, filings or drillings of iron, steel, copper, “ and other metal, pounded glass, flints, or quartz, or siliceous “ sand, either singly or in the form of mixtures of two or more



## 224 INDIA RUBBER AND GUTTA PERCHA :

“ of them,” “ to impart any particular color to the compositions, “ mix therewith any of the ordinary pigments or stains.”

The mass is formed into sheets or skins by passing it between rollers or cylinders of metal, stone, wood, or paper, or any combination of the same, the surfaces of the said rollers or cylinders being polished, grained, or figured.”

“ Or blocks or lumps are cut into sheets or skins by means of knives or saws ;” or “ sheets ” “ are formed ” “ by spreading it on the surface of an endless band of metal, parchment, leatherfelt, gutta percha, indian rubber, canvass, calico, or any other textile fabric or suitable material, in a common spreading machine, adhesion between the band and the then preparing artificial leather being prevented by keeping the surface of the former moistened with water or oil, or with a weak solution of soft soap or sugar.”

These articles are treated in a great variety of ways, depending upon how they were prepared and the nature of the object to which they are to be applied, in a manner somewhat resembling the like operation with animal leather. Those prepared with salts are steeped, &c. in water, &c., and are manipulated till “ their pores open and they become sufficiently soft and flexible.” When ammonia, its compounds, or a volatile substance is employed, the skins, &c. are exposed to a current of hot air, &c.

[Printed, 4½d.]

A.D. 1852, October 23.—Nº 502.

GRAHAM, CHARLES WILLIAM (*a communication*).—“ Improve-  
“ ments in the manufacture of bottles and jars ;” and these are,  
“ the mode or modes of manufacturing bottles and jars with  
“ screws on the exterior of their necks or orifices,” as described.  
“ A quantity of glass is gathered on the end of a blowing pipe,”  
“ and is blown in the usual manner until it approximates to the  
“ required size,” “ the glass still adhering to the pipe is then  
“ introduced into the mould,” an iron one, “ in the neck of  
“ which a female screw is formed ;” the mould is shut, and a  
cylinder with a piston is placed upon the blowing pipe and pressed  
upon it, drives the air contained in the cylinder “ into the bottle,”  
and expands it into the mould. Instead of the cylinder and  
piston “ the blowing pipe may have a small globe or reservoir of  
“ compressed air attached to its side, and communicating with

"it by means of a stopcock." The bottle, &c. may be made of gutta percha in a similar manner, or "hot water may be forced in to produce the pressure instead of air, and then cold water may be introduced to displace the hot water and to cool the gutta percha, so as to fix it in the form which it has received. In this case the blowing pipe is to be made double, or with another pipe enclosed within it, so that the hot or cold water may enter at one pipe and escape at the other."

[Printed, 54d.]

A.D. 1852, October 23.—N° 505.

MACBAY, WILLIAM.—"Improvements in extinguishing fire in dwellings, factories, and other buildings, and in ships;" and these are "having a number of pipes charged with water, steam, or carbonic acid gas," distributed through the buildings, &c., and which pipes have "a number of projecting perforated nozzles with caps or covers thereon made of gutta percha or fusible metal." Should an accidental conflagration occur in such a room or place, the heat thereof would quickly cause the gutta percha or fusible metal cap or cover to melt, thereby releasing a body of water, &c., which, when under pressure, would saturate the room or place, and immediately quench the fire, thereby confining it to that apartment alone."

[Printed, 34d.]

A.D. 1852, October 23.—N° 510.

TAYLER, JOHN, and SLATER, JAMES (*partly a communication*).—"Certain improvements in machinery, apparatus, or implements for weaving." These improvements are many and varied, and are said to relate more "especially to power looms, shuttles, and self-acting temples," the economizing of which is obtained by diminishing the liability to fracture the machinery and material, and lessen the labour and cost of the machinery. The first improvement is, "the use of caoutchouc or india rubber as a material for the springs, by which the attachment of temples to the framing of the loom is rendered yielding or elastic, and the mode" described "of constructing such springs." The mode of construction is either "by inserting india rubber in a block, or series of layers, between two plates prepared for its reception, or by arranging a number of discs or washers

## 226 INDIA RUBBER AND GUTTA PERCHA:

" of india rubber upon a rod or spindle, with alternate washers of iron, or other rigid substance, interposed between them, in either case using the elastic cushion so formed as an abutment for the temple against the beat up of the slay." These springs of india rubber are applied throughout several parts of these improvements. Another improvement is, employing "galvanized iron, or iron coated with zinc and gutta percha, as materials for constructing those parts of box and roller temples which are exposed to the contact of the cloth in weaving where wet weft is used."

[Printed, 1s. 0½d.]

A.D. 1852, October 25.—N° 512.

STOLL, JOHN JAMES.—" Improvements in the manufacture of boots and shoes and similar articles, and in machinery used therein, entitled metallic toothed or wedged seams, and waterproof elastic indented stitches."—*This invention did not proceed to the Great Seal.*—In carrying out these improvements, caoutchouc and gutta percha, in solution and otherwise, are employed, also wax and marine glue; and to render the leather firmer, instead of beating it as shoemakers do, it is rolled between rollers of metal or of wood. If the rollers are of wood they should be covered with sheet metal or gutta percha.

[Printed, 3½d.]

A.D. 1852, October 26.—N° 524.

ROWLEY, CHARLES.—" Certain improvements in nails;" and these are, ornamenting the heads of nails by the application of glass, coloured or plain, &c. "stones, porcelain, ivory, bone, pearl, tortoiseshell, leather, wood, gutta percha, vegetable ivory, or other suitable substances," &c. The application of gutta percha is described. Gutta percha pressed into a mould (the head) while the gutta percha is in a warm state, and while in that state "apply the shank, which may be of half round wire," doubled so as to leave a looped hole, which is made to enter the head of the button. Other modifications of this are described. Woven fabrics, &c. are pressed into the mould with the gutta percha and adhere to it, thus ornamenting the head when taken from the mould.

[Printed, 5½d.]

A.D. 1852, October 27.—N<sup>o</sup> 533.

**BAINBRIDGE, ANTHONY FOTHERGILL.**—"Improvements in the manufacture of artificial flies and other bait for fish;" and these are, constructing the wings or other projections of artificial bait, that such bait shall have peculiar elasticity, and, if desired, rotate when in the water, by reason of the wings or projections being attached by means of elastic and flexible connections made of wire, vulcanized india rubber, gutta percha, or other flexible or elastic material. "The wings have holes through them near their sockets, into each of which are passed a vulcanized india rubber thread, these are each tied with silk separately, and afterwards united with wire, &c. and secured to the hook. By means of the wire the wings, fins, or projections are made to take whatever position is desired." A swivel on the line, near the bait, causes rotation. The wings may be "thin sheet horn, gutta percha, talc, and other matters not injured by wet;" or feathers bound in a particular way "round a piece of india rubber."

[Printed, 5½d.]

A.D. 1852, October 27.—N<sup>o</sup> 536.

**CROSBY, JAMES.**—"Improvements in looms."—*This invention did not proceed to the Great Seal.*—It consists of a mode "to avoid the sudden blow and severe shock or strain which, by the present construction of looms, is given to the warp threads every time the slay or lathe beats up the weft thread in the process of weaving, whereby," "to a great extent, the breakage of the warp threads is prevented," and "a more even cloth, especially in weaving fine descriptions of fabrics, is produced." "This improvement is applicable to all kinds of looms for the manufacture of cotton, silk, linen, woollen, or other textile fabrics, and" is "accomplished" "by connecting the slay or lathe to crank arms, or other convenient position or portion of the loom; by springs, made of steel or other suitable metal or material; or instead of springs," "use for the same purpose some elastic substance, as india rubber, or any composition of india rubber with other materials or substances of an elastic nature, which will have the effect of lessening the shock by giving an easy and yielding blow in beating up, as before stated."

[Printed, 3½d.]

A.D. 1852, October 27.—N° 537.

BERTOLACCI, WILLIAM ROBERT.—“ An improved pneumatic “ ink and pen-holder;” by which “ a flux and reflux of the ink “ from the reservoir to the pen, instead of having a continual “ flow,” is obtained. It consists of a tube or reservoir, in which is inserted a tube of vulcanized india rubber, if anything larger than the reservoir. The pen is inserted between these two tubes. The ink is made to egress underneath the pen; a pressure nob passing through the reservoir presses against the india rubber tube. In the upper part of the tube or reservoir is a piston, an arrangement of rings, nobs, and india rubber, which is moved up and down by a tube, turning round with a screw, moving in the screw of the piston rod. “ In order to fill the reservoir with ink ” place the lower end, or pen end, in a vase containing ink, and “ turn the tube “ backwards, so as to effect the ascent of the piston.” When the pen is required for writing screw the tube in the opposite direction, until the ink is just perceived to enter the pen, and press the knob with the thumb to fill the pen, after which raise the thumb. “ The “ caoutchouc, by its elastic property, will repel the knob, and “ resuming its cylindrical form, and its former capacity, will suck “ the ink up again, leaving the inner surface of the pen moistened.” The pen is replenished by touching the knob.

[Printed, 7½d.]

A.D. 1852, October 27.—N° 539.

LE GRAS, LOUIS NAPOLEON, and GILPIN, WILLIAM LAWRENCE.—“ A compound having the properties of gutta percha.” —*This invention is void by reason of notice to proceed not having been given within the time prescribed by the Act.*—It “ consists “ in ” “ the production of a compound possessing the properties “ of gutta percha, and suitable as a substitute for it.” “ This “ compound is made by taking gums or glutinous matter, asphalte, “ bituminous or pitchy matters, and oily or oleaginous and fatty “ matters, such as may be found in the United Kingdom of Great “ Britain and Ireland, compounding them well together, and dry- “ ing, hardening, softening, or elasticating them, according to the “ particular uses to be subserved thereby.”

[Printed, 2½d.]

A.D. 1852, October 27.—N° 547.

SMITH, JAMES HENRY.—“Improvements in corsets;” and these improvements are, “arranging separate pieces of elastic materials in corsets, so as to act in unison with the anatomical structure, thereby promoting free muscular motion, and permitting of healthy respiration.” These pieces “are made of india rubber, webbing, or braid, or other similar material,” and may be lined with flannel, silk, or other material, and “are interlaced and crossed in various directions, variable in number, size, and position, in conformity with individual configuration.” This arrangement is, as nearly as possible, a counterpart of the arrangement of the muscles and ligaments of the female human form.”

[Printed, 8½d.]

A.D. 1852, October 28.—N° 551.

PROVOST, HENRY.—“An improved hat protector.”—*This invention did not proceed to the Great Seal.*—It “consists in making hat cases of a light woollen or other fabric, coated on one side with india rubber dissolved in spirits of turpentine, so that the material is rendered waterproof; the side of the hat cover not coated with the india rubber, is placed so as to show extriorly, and imitate as closely as possible, the appearance of the silk or beaver of a hat. These hat covers or cases are slit at the side, and are furnished with small hooks and eyes to keep the two edges together.” “The edge of the hat cover has a hem, affording admittance to a narrow india-rubber band; this band is fastened in several places on the hat cover. The india-rubber band so contracts the opening of the hat cover, that to make the rim of the hat enter it must be stretched. The hat cover or protector may thus be made to fit perfectly close.”

[Printed, 2½d.]

A.D. 1852, October 29.—N° 566.

LE GRAS, LOUIS NAPOLEON, and GILPIN, WILLIAM LAWRENCE.—“Improvements in transmitting electric currents.”—*This invention is void by reason of notice to proceed not having been given within the time prescribed by the Act.*—It “consists in making use of water as a conductor of electricity in place of

## 230 INDIA RUBBER AND GUTTA PERCHA:

"wires as now ordinarily employed." "Place the water in a tube of gutta percha or other non-conductor of electricity, or in a metal tube protected internally by a coating of gutta percha, or other non-conducting substance." "In the case of a submarine telegraph," "place three or four water tubes together, and in order to prevent any strain from rending the tubes or breaking them, make use of ropes running the whole length of the telegraph, and make them bear the strain."

[Printed, 2½d.]

A.D. 1852, October 30.—N° 569.

BINNS, WILLIAM. — "An improved mode of constructing a draught breast plate or collar for horses, or other draught animals."—*This invention is void by reason of notice to proceed not having been given within the time prescribed by the Act.*—"It consists in constructing an universal adjusting and shifting draft breastplate or collar," "of iron, steel, or other suitable metal, or a combination of wood and metal, so arranged and united by means of a metallic joint as to expand and contract, and thereby yield to the shape of the animal, or to effect the same purpose by means of vulcanized india rubber or gutta percha separately or combined with cotton, linen, or other suitable fabric, in place of the metallic joint aforesaid. The tugs or draft plates are also so constructed as to be raised or lowered at pleasure."

[Printed, 2½d.]

A.D. 1852, October 30.—N° 573.

BIRD, EDWARD, and WELCH, EDWARD.—"An improved cart or vehicle."—*This invention is void by reason of notice to proceed not having been given within the time prescribed by the Act.*—"These improvements in a cart (which will be extremely useful in the Colonies) consists, first, in "placing the seat of the driver behind the body of the cart, by which arrangement he will be able to protect the property conveyed from injury or theft better than in a vehicle of the old construction, and parcels, letters, bags, or other matters can readily be delivered without the driver leaving his seat."

Second, "in the addition of one or more swivel guns fixed on the vehicle, when gold or other precious merchandize has to be con-

"veyed." And, lastly, "in lining the vehicle with gutta percha, or other substance impervious to water."

[Printed, 2½d.]

A.D. 1852, October 30.—N° 582.

SINCLAIR, JAMES.—"Improvements in engines to be worked by steam, air, or water, the said improvements being also applicable to pumps;" and these are in "the arrangement and construction of a motive power engine or pump, consisting of an oscillating cylinder contrived to oscillate upon a fixed journal centre at its lower end. This journal or trunnion answers for the ingress and egress of the steam, air, or water to and from the cylinder, so that the whole actions of the engine may be performed without the use of any further mechanism, the requisite changes of position of the working parts being effected by the mere oscillation of the cylinder consequent upon the traverse of the piston in causing the revolution of the crank." When used as a hydraulic engine, or actuated by water, the working piston is composed of two plates or discs, one of which has an eye to embrace the piston rod, round which rod is put a vulcanized india-rubber ring, and over that again one or more rings of leather. The leather rings are on the outside of the india rubber, and the two pieces of the piston being then screwed together, the end compression forces out the leather from the centre against the interior of the cylinder." "The system or mode of constructing pistons with internal expanding rings of india rubber and external rings of leather" is claimed."

[Printed, 6½d.]

A.D. 1852, November 1.—N° 595.

WATSON, JOSEPH JOHN WILLIAM, and SLATER, THOMAS.—"Improvements in galvanic batteries, and in the application of electric currents to the production of electrical illumination and of heat, and in the production of chemical products by the aforesaid improvements in galvanic batteries." The object of this invention mainly is to produce pigments, and it is stated that this is effected by "the introduction into galvanic arrangements" "new exciting agents or electrolytes and chemical compounds



## 232 INDIA. RUBBER AND GUTTA PERCHA :

“ and substances, whereby the chemical products which are now  
 “ ordinarily obtained from the working of known forms of gal-  
 “ vanic batteries are rendered of great commercial value.”  
 Batteries of different kinds are employed, and the solutions of  
 the salts put into the cells differ according to what is required.  
 Ferrocyanide of potassium and chromate of potash are the salts  
 principally employed, and the favoured batteries are of zinc and  
 iron and zinc and lead ; and a claim is made to the “ construction  
 “ and use of galvanic batteries in gutta percha, or other material  
 “ of the form and principle,” as follows :”—“ A gutta percha box  
 “ about three feet long, is divided into twelve cells of about three  
 “ inches wide of the full depth of the box ; running along the  
 “ edge of the box is a trough, but which is removed about three  
 “ inches above and out from it ; the bottom of this trough is per-  
 “ forated with holes, to each of which is attached a small tube,  
 “ which is bent upon itself, and then hangs over and enters each  
 “ cell ; there are therefore twelve tubes and twelve holes in the  
 “ trough ; to each cell there is a cock at the bottom, and the  
 “ twelve cocks are open and shut simultaneously by a traversing  
 “ rod, which runs the whole length of the cells. By the above  
 “ arrangement it is easy to fill the cells with any liquor, and  
 “ draw off the products of the action of the battery at the same  
 “ time, and thereby reduce greatly the time which would be occu-  
 “ pied in preparing the battery for a new action. The whole of  
 “ the above battery is made of gutta percha,” but the above  
 arrangement is not confined to any particular material. “ The  
 “ nitrous fumes from the batteries are occasionally collected ” by  
 “ means of a false gutta percha cover, consisting of a lid, within  
 “ which is a chamber or flooring, the entrance to which is by  
 “ trumpet-mouthed apertures entering from below, another lid  
 “ closing the chamber or tray.

[Printed, 44d.]

A.D. 1852, November 3.—N° 622.

LEY, GEORGE WILLIAM.—“ The manufacture of a material to  
 “ be used for certain purposes, instead of wood, leather, millboard,  
 “ or oilcloth.”—*This invention is void by reason of notice not  
 having been given within the time prescribed by the Act.*—It con-  
 sists “ in combining gutta percha with dry peat dust, or turf dust,  
 “ in the proportion of about one part of the former to about three

“ parts of the latter. Heat is required to effect this combination.  
 “ The material, may be formed into sheets, blocks, or other forms,  
 “ by rolling or pressing.”

[Printed, 2½d.]

A.D. 1852, November 3.—Nº 623.

LEY, GEORGE WILLIAM.—“ A method of imitating carvings in  
 “ wood.”—*This invention did not proceed to the Great Seal.*—It  
 consists “ of attaching shavings of wood to the surface of a plastic  
 “ material by the pressure of metal or wood moulds, similar to  
 “ those used in manufacturing papier maché ornaments,” as  
 follows:—Take “ gutta percha in a manufactured state,” and  
 “ heat and knead ” it “ through heated metal rollers, or in a  
 “ heated mortar with a pestle; and while in this state of partial  
 “ fusion, gradually sift over the surface a certain quantity of dry  
 “ bog peat dust or turf dust, repeating this operation and  
 “ kneading in the dust with the gutta percha, so as completely  
 “ to mix or incorporate the one with the other. The proportion  
 “ of dust to gutta percha will depend upon the purpose to which  
 “ the material is to be applied, and the pressure to which it is to  
 “ be subjected, as well as the heat at which the material is to be  
 “ worked.” “ Take this material in a heated or plastic state, and  
 “ press it into a metal or wood mould ” “ with sufficient force to  
 “ obtain an impression of the moulding. When the material is  
 “ cool, trim and remove it from the mould, and apply a coating  
 “ of liquid india-rubber cement, and repeat this coating, if neces-  
 “ sary, once or twice, allowing each coating to dry between;”  
 “ next take some shavings of an ornamental or other wood, pro-  
 “ duced by an ordinary steel plane or scraper, and having applied  
 “ on one side of them a similar coat or coatings of liquid india-  
 “ rubber cement,” place these shavings with the cemented  
 “ surface downwards upon the moulding, arranging them so  
 “ that they shall match each other as nearly as possible, and be  
 “ of sufficient length and breadth to enter into the hollows of  
 “ moulding, at the same time taking care to make the grains of  
 “ the shavings run one way,” then “ press the moulding, now  
 “ covered with shavings, as before, whereby it becomes perfectly  
 “ developed, and resembles carving in wood.”

[Printed, 2½d.]

A.D. 1852, November 5.—N° 651.

HUGHES, HESKETH, and DENHAM, WILLIAM THOMAS.—  
 "Certain machinery for the manufacture of fancy ribbons, ornamental trimmings, chenilles, fringes, and gimps." This invention consists "in winding silk, cotton, wool, or even fine wire, or other material of which the fabric is to be composed, on to guides, from whence it is taken off and pressed between rollers and spun up or twisted, or not, as required." In some cases, to "produce a fringe or chenille," adapt cutters of various shapes, so as to cut the edges of the material after it passes off the guides; in other cases leave a looped edge. The guides may be fixed to any required width within the capabilities of the machine, or they may be made moveable laterally by means of cams or cones, whereby to arrive at an infinity of pattern and shape in the article produced. In almost all cases a foundation of one or more threads of cotton, gutta percha, wire, silk, or other description of thread runs longitudinally the whole length of the fabric to be produced, and on, over, or between which threads the threads from the guides are deposited. Sometimes the rollers are heated, "and generally the foundation thread" is sized "when a metal or gutta-percha thread is not used. In some instances the rollers" are embossed or engraved.

[Printed, 11½d.]

A D. 1852, November 5.—N° 656.

DUNDONALD, Admiral the Earl of.—"Improving bituminous substances, thereby rendering them available for purposes to which they never heretofore have been successfully applied." The bituminous substance gas pitch is melted in pans, and a certain amount of resinous matter added to it, together with a certain amount of viscous or unctuous oil of tar, or similar oil, by preference "saturated with caoutchouc," and "stir the whole until the solution becomes amalgamated." Stones, bricks, &c. are heated and dipped in the above mixture, and dropped "around a pier, or structure desired to be protected," "until coated stones so dropped accumulate sufficiently to guard the foundation from further injury." These mixtures may have grit, sand, &c. mixed with them. Caissons may be made with such materials. Sands, rolling gravel, &c. "may be arrested and consolidated

"by pouring this mixture thereon," and the interstices between the stones of breakwaters may be filled with it. "Rude works, such as these, may be performed by means of factitious bitumens and pitch," but "the natural cohesive bitumen of Trinidad or New Brunswick, which has gradually been deprived of its volatile components" is preferred. These are ground, sifted, and masticated with about one tenth their weight of unctuous oil, rolled and thoroughly washed "in tepid water." "This mixture, with the addition of gummy and resinous matters (open to public use), constitutes a preparation of great flexibility, of which water pipes may be formed free from the noxious impregnations imparted by leaden pipes." It may be used for joining pipes, &c., &c., and dissolved in unctuous oils, obtained "by arresting the process of distillation in extracting naphtha before the induration of pitch;" it may employed for bottoms, floors, &c., &c. of ships.

[Printed, 34d.]

A.D. 1852, November 6.—N<sup>o</sup> 659.

GOSNELL, JOHN, EDWARD, and CHARLES.—"Certain improvements in brushes;" and these principally relate, in hair brushes, to "arranging and setting the bristles in divisional blocks," "with alternate spaces or intervals between them." These blocks of bristles are of "various degrees of strength, and either of even cut bristles, or uneven cut, or of both even and uneven cut combined," and they are set "at any particular angle, as may be required." A part of the invention consists of having an external casing on "paint brushes" of "any metallic or elastic or other suitable material to clip around the entire of the bristles in one or more pieces, and so constructed as to move up and down over the ordinary binding of the bristle, so as to give any length of bristle the workman may require, according to the work he may be operating upon; and such band or encasement or clip to be so arranged as to work up and down at pleasure, either by slide or screw, or spiral." "And the introduction and use either of porcelain or gutta percha label plates or tablets for brushes."

[Printed, 54d.]

236 INDIA RUBBER AND GUTTA PERCHA :

A.D. 1852, November 6.—N° 660

NICHOL, JAMES.—“Certain improvements in the process of “graining or ornamenting surfaces and fabrics;” and these are, “graining or ornamenting surfaces and fabrics by means of the “stereotyping process,” as follows:—To multiply copies of a grained or ornamented surface, “the material bearing such surface is placed upon a smooth bed,” &c., and the plastic or or elastic substance softened, when necessary, and which may be either wax, gutta percha, &c. pressed upon it and allowed to cool, is taken from it. The original pattern is transferred from this reverse “to a mould of stucco or papier mache, or other suitable “material by means of the ordinary process of stereotyping.” A cast in metal is taken from this mould on “to the surface either “of a plate or a roller, as preferred.” “To produce the pattern “on the surface of the roller, the mould must be composed of a “flexible or elastic material, and bent within a mould of the “required form,” and from this surface the grain or pattern may be printed by any convenient press “upon the surface or fabric “requiring to be grained or ornamented.”

[Printed, 2½d.]

A.D. 1852, November 8.—N° 678.

Longbottom, Robert Isaac.—“Improvements in preventing vibration in railway and other carriages, and in axles.”—*This invention did not proceed to the Great Seal.*—These improvements are, surrounding “the axle, the arms, and the boxes of carriages “with felt, vulcanized india rubber, or other suitable non-conducting medium, whereby the sound consequent on vibration is “absorbed, and vibration is prevented from being communicated “to the axle and also to the body of the carriage. Crystallization “of the axles will thus generally be entirely obviated.”

[Printed, 2½d.]

A.D. 1852, November 9.—N° 680.

HENLEY, WILLIAM THOMAS.—“Certain improvements in “electric telegraphs, and in the apparatus and instruments connected therewith;” and these are, first, the “methods of constructing and fixing insulators for wires for electric telegraphs, “the insulators being in the form of a sheave or roller of gutta

“percha, earthenware, or other non-conducting material, and fixed to the post or supports by holdfasts through the axis of the sheave or roller, so that in the movement of the sheaves or rollers on their axis the wires can be readily brought parallel with each other.” Likewise “supporting the insulators on metal hooks, with or without iron clamps for holding the wire.” This is a hook screwed into the post and turned upwards at right angles, on which is placed “a stout thimble of gutta percha of considerable substance;” also “the mode of making non-conducting shackles,” as follows:—“Two “discs” are cast of iron or metal, of about two inches diameter, with deep chamfered holes in each, and with a hook or eye on the chamfered side; a solid piece of gutta percha, about three inches long, is passed through the holes in the castings, and is heated at the ends and spread out so as to fill the chamfers. Another form of shackle is made of two pieces of metal, each forming a loop or eye with a hook for attaching the wire; or two simple rings of metal will answer the same purpose,” and pass a piece of gutta percha through the rings, and unite the ends by heat.” “India rubber may be substituted for gutta percha.” “The method of applying the rack and pinion or the rollers and band and chain for the temporary purpose of stretching the wires.”

Second, “the method of protecting insulated wires,” “and a double covering of submarine rope, and the wrought iron troughs and boxes.” Ordinary gutta percha coated wire is covered by machinery, with a double covering of tarred yarn, in opposite spiral directions; then lap, in opposite spiral directions also, small-sized iron wire, by preference galvanized. For the protection of gutta percha wires, covered or otherwise, troughs may be used of wrought iron or zinc made by rolling; a larger trough, though shallower, “forms a lid or cover for the other.” These troughs it is preferred should be made of galvanized iron.

Third, improved reversing apparatus; see “Abridgments of Specifications on Electricity.”

Fourth, “The peculiar construction of voltaic battery, and the method of using it for electric telegraphs when removed from the solution.” This is, “constructing the battery with one cell only, but with a number of plates, with felt, flannel, or similar material between each pair, the plates being perforated in the centre and clamped on an insulated axle (but not too tight), that is, an axle covered with non-conducting material, which

238 INDIA RUBBER AND GUTTA PERCHA:

" may be formed of varnished wood or metal covered with gutta percha, or other suitable substance. The battery is not intended to be used when immersed in the fluid, as in the usual way, but when removed from it, the felt retaining moisture sufficient to work the telegraph for a whole day without a fresh immersion."

[Printed, 8½d.]

A.D. 1852, November 9.—N° 688.

OGILVIE, GEORGE SHADFORTH.—"Improvements in candlesticks and lamps;" and these consist "in a peculiar arrangement of metal or india-rubber springs for retaining the snuffers and extinguisher in their proper places, and preventing them from falling out when the candlestick is being carried about or moved." Near the bottom of the stem of the candlestick is a socket, into which a tube is fitted. "This tube contains a small metal catch, with a slightly convex surface" exteriorly, and in the interior two plugs of caoutchouc, and "a small metal button or disc, having a rounded surface, is fitted loosely into the inner extremity of the fixed socket," "projecting slightly beyond the end of it." This projecting button presses against the box of the snuffers, and the extinguisher or shank having a small hollow in it is held by the convex metal catch pressing into it. Instead of these arrangements, the snuffers may have a somewhat similar spring on the top of the box, and the shank of the snuffers may likewise hold the spring. Another mode of holding the snuffers is by two strips of metal fixed obliquely in the interior of the stem, and, if necessary, held together at the top by an india-rubber band.

[Printed, 5½d.]

A.D. 1852, November 12.—N° 722.

KENDALL, GEORGE.—"Certain improvements in apparatus to facilitate the manufacturing of mould candles." In these improvements relating to the above manufacture, and which are fully described, is the having "an elastic or a yielding cap for the lower end or tip of the moulds, which performs the two functions of stopper and friction brake to stretch the wick." These caps may be of "vulcanized india rubber," although the right to use for this purpose any yielding or elastic substance or con-

“trivance whatsoever, such as felt, leather, cork, or elastic packing of any kind, or two or more pieces of wood, metal, or other rigid substance, pressed towards each other, to embrace the wick tightly, and also to press against the lower end of the mould, so as to prevent the leakage of the fat, and to retard the passage of the wick, so as to require it to be pulled hard enough to stretch it tightly in the mould,” is claimed.

[Printed, 11½d.]

A.D. 1852, November 15.—N<sup>o</sup> 757.

**TAYLOR, THOMAS.**—“Improvements in apparatus for measuring water and other fluids, which apparatus is also applicable to the purpose of obtaining motive power.” This invention consists in a peculiar method “of employing a wheel having vanes or blades attached thereto, and against which the water or other fluid is caused to act, so as to effect a rotation of the said wheel, from which rotation the quantity of fluid will be registered. The wheel provided with vanes is placed in a chamber, leaving a space between its periphery and the inside of the case; the fluid to be measured is admitted through suitable apertures attached to the chamber and allowed to flow out through others, but in thus passing from the one to the other it causes a circular current of the fluid in the chamber to take place, and impinges upon the vanes of the wheel, thereby imparting motion to the rotatory wheel, and in proportion to the quantity of fluid drawn off. A peculiar feature in the wheel consists in making its specific gravity about the same as the fluid to be measured, so that it will float (or nearly so) therein, by which provision the consequent buoyancy will prevent considerable amount of friction which would otherwise take place at the bearings.” “One method of effecting this consists in constructing the wheel of thin metal hollow, and joined together water tight, so as to enclose a volume of air to the exclusion of the fluid; this will, of course, effect a buoyancy, and weights may be subsequently adapted, in order to regulate the specific gravity of the whole to the point required.” “A more simple method, for general purposes, however, is to construct the wheel of gutta percha, which material is of itself about the specific gravity of water.” This arrangement may be employed for the purpose of obtaining motive power.

[Printed, 5½d.]



240 INDIA RUBBER AND GUTTA PERCHA:

A.D. 1852, November 17.—N° 775.

FONTAINEMOREAU, PETER ARMAND le Comte de.—“Certain improvements in weaving elastic tissues.”—*This invention is void by reason of notice to proceed not having been given within the time prescribed by the Act.*—It “consists in producing “an elastic tissue having the appearance of woollen cloth, and “without any ribs,” using “with every kind of loom an harness “composed of three warp lames, forming satins of another warp “lame in india rubber, forming taffety or plain ground, and of “six marches or treadles, or of one march, by means of a jacquard “harness. It will be easily understood that such an harness will “produce only plain ground; to obtain figured tissues, the harness must be modified accordingly.”

[Printed, 2½d.]

A.D. 1852, November 17.—N° 777.

WATT, WILLIAM.—“Improvements in preparing for weaving “and in weaving flax and other textile materials.”—*This invention is void by reason of notice not having been given within the time prescribed by the Act.*—In the ordinary mode of weaving by power loom, there is a deficiency of elasticity to resist the action of the slay, which occasions the yarns to be injured or broken; to obviate this defect, and to produce more equal tension on the yarns, carry the yarns from the warp beam or roller over or under an elastic roller. One mode of constructing this roller is to employ “a tube of vulcanized caoutchouc, or other similar substance filled with compressed air, or other fluid. Elasticity is “thus given to the whole warp, and if any of the yarns are more “tightly stretched than others, the tight ones sink into the “roller and force the air to those parts of the roller in which “the yarns are slacker, and the tension is thus more nearly “equalized.”

[Printed, 2½d.]

A.D. 1852, November 17.—N° 778.

PHYSICK, HENRY VERNON.—“Improvements in electric telegraphic apparatus, in machinery or apparatus for constructing “the same;” and these are, first, “covering or coating wire with “calico, cloth, or other fibrous material, saturated, or impregnated,

or coated with gutta percha, shellac, tar, pitch, or similar insulating material, by drawing the wire or cloth or other fibrous material through a triblet or die, or series of dies, by means of which the cloth or other fibrous material is made to surround the wire, and to have a lap-joint where its edges meet."

Second, applying "an exterior covering of iron, copper, or other suitable material to the outside of insulated wire by means of a triblet or die, or series of dies, the continuity of such covering" may be broken "at intervals."

Third, "constructing machinery or apparatus for coating or covering wire by means of a triblet or die, or series of dies, constructed as herein-before described, and applied in connexion with a revolving drum or other suitable machinery for drawing the wire through" them.

[Printed, 5½d.]

A.D. 1852, November 19.—Nº 784.

WALKER, ROBERT.—"Improvements in the construction of portable houses and other erections;" and these are said to relate especially to "the construction of portable dwellings or stores suitable for emigrants from wood and iron combined." "In building such houses, a rectangular base frame is first laid down, and upon this frame" "the required number of cast-iron pillars is bolted down at the four corners, and at other regular intervals." "Every pillar is grooved or slotted vertically down four opposite sides, so that suitable boards may be passed with their ends down such grooves one above the other edgewise to form the walls and partitions of the building. Such boards are tongued and grooved." "The window frames are of cast iron, grooved all round their outer edges in order that the ends and edges of the contiguous boards may be inserted therein. The doorways are also formed with a similarly grooved frame." "The roof is either of corrugated iron, angular or rounded, or it may be made of thin flooring boards bent to the required arch and screwed down at each end, the weather covering being simply asphalted felt in sheets, or layers, of waterproofed paper or canvas. Or various other coverings may be adopted over the top of the boards or other support."

[Printed, 6½d.]

242 INDIA RUBBER AND GUTTA PERCHA:

A.D. 1852, November 19.—N° 796.

BESSEMER, HENRY.—“Improvements in the crystallization “ and manufacture of sugar.” The object of this “invention is “ to substitute steam or other motive power for much of the “ manual labour consequent on the use and removal from place “ to place of the vast number of small conical moulds” now “ employed in the production of “crushed lump” sugar;” also to slice more perfectly the sugar “without its previous removal from “ the vessel in which it is crystallized, and to ensure the formation “ of a larger crystal” by using “large deep vessels” to retain the heat. And in carrying out these improvements, “the use of “ vulcanized india rubber, or other yielding material, as a covering “ to rollers for breaking the lumps of sugar, but which yielding “ material “is not hard enough to crush the crystals of sugar,” is claimed.

[Printed, 7½d.]

A.D. 1852, November 22.—N° 821.

BLAIN, JOSEPH.—“A new system of corking.”—*This invention is void by reason of notice to proceed not having been given within the time prescribed by the Act.*—The cork, which has a hole pierced through it in the centre, to receive afterwards a conical-shaped piece of hard wood, is placed in the neck of a bottle “ filled to about 2 inches from the top of the neck, and pressed “ down until the liquid appears above it, when the piece of wood “ is pressed gently into the hole. “A thin layer of melted sulphur, “ wax, or any other like substance, is then poured upon the cork.” “ Pure alcohol is then poured in the neck of the bottle,” and a second cork is fixed. The corks may have wires attached so as to dispense with cork screws. The object, however, being principally to prevent “the least contact of air.”

[Printed, 4½d.]

A.D. 1852, November 23.—N° 834.

WATT, CHARLES.—“Improvements in obtaining currents of “ electricity;” and these are, first, in galvanic batteries, which consist of combining different metals or substances in succession in such manner that heat, “steam, hot air, or otherwise obtained,”

may be applied at one end and cold at the other end, thus dispensing with the use of fluids. This is effected as follows:—In preference, the metals antimony and bismuth are cast together in plates, that is to say, antimony forms one end of the plate and bismuth the other. These compound plates are arranged in rows, and divided so that cold may be applied to one part of the plate while heat is applied to the other. This separation is better effected by having “on the upper edges of the partitions” “vulcanized india rubber” “upon which the plates are placed,” and packings with vulcanized india rubber.

Second, “giving to armatures of electro-magnets a rotary and reciprocating action.

(See “Abridgments of Specifications upon Electricity, Magnetism, &c.”)

[Printed, 5½d.]

A.D. 1852, November 24.—Nº 842.

BRACKENBURY, AUGUSTUS. — “Making an electrifying machine of materials not hitherto used for such a purpose.”—*This invention is void by reason of notice to proceed not having been given within the time prescribed by the Act.*—It consists in “the production of electricity by drawing gutta percha between cushions made of silk or any other suitable material, so as the cushions when pressed towards each other by springs or any other means would rub the surfaces of a sheet or riband made of gutta percha sufficiently hard, so as to produce or excite electricity when the sheet or riband of gutta percha is moved forward and backward between them.”

[Printed, 2½d.]

A.D. 1852, November 25.—Nº 860.

HALL, WILLIAM.—“Improvements in rotary steam engines, governors, and apparatus for supplying boilers with water, and for regulating the same;” and these consist “in the better arrangement and adaptation of rotary steam engines by means of governors for regulating the same, and for working the steam expansively or not, and also for the supplying of water to boilers generally, and regulating such supplies.” In carrying out these improvements in engines, the packings of the

244 INDIA RUBBER AND GUTTA PERCHA:

piston, &c. are formed of metal plates with india rubber between them, and springs which keep "the packings in contact with the cylinder." Also, in the supplying of water, the glass to show the height of water in the boiler "is made tight at each end with an india-rubber ring, forced in contact with the glass by a screw acting on an iron ring."

[Printed, 2s. 2½d.]

A.D. 1852, November 26.—N° 873.

GLOVER, CHARLES CLAUDE.—"A system of stoppering instantaneously bottles and other vessels used for containing aerated liquids."—*This invention is void by reason of notice to proceed not having been given within the time prescribed by the Act.*—On the neck of a bottle an inverted cone is placed, the lower part of which is connected with a tube passing nearly to the bottom of the bottle. This cone is surrounded by a socket of india rubber. A bent pipe leads out through washers of india-rubber and metal from near the junction of the cone with the tube. A valve keeps the end of the tube closed in the cone until it is opened by pressing a lever which passes outwards through washers of india rubber and metal. Another mode is described, which is a modification of the foregoing, "only, to empty the bottle, it must be turned upside down, whereas in the first it was sufficient merely to press on the lever."

[Printed, 4½d.]

A.D. 1852, November 26.—N° 884.

FEATHER, ROBERT BARNARD.—"Improvements in the construction of ships, and in rendering ships and boats impervious to shot." The bottom or lower part of the vessel is constructed of timber, "and plates of iron are raised upon iron staunchions or ribs made sufficiently strong, and formed with equalized saddle bars, set across the timber heads, main walls, and ceilings over the futtocks to the keel inside, and outwardly as low as necessary, and firmly bolted through them; the main timbers rising to the full height required at distances of twenty feet from each other," &c. These vessels are rendered shot-proof by three linings; first, of hides; second, of caoutchouc; third, of good sound cork, in each case glued or spiked together. The

hold and deck beams are of timber or iron, "and all the decks  
" below the upper or quarter deck are to be laid with iron instead  
" of wood."

[Printed, 9½d.]

A.D. 1852, November 26.—N° 889.

HUDDART, GEORGE AUGUSTUS.—"Improved manufacture of  
" artificial flies;" and this consists in "obtaining a close resem-  
" blance to the natural insect, by forming the wings in moulds  
" or dies, which are provided with lines or markings correspond-  
" ing to or in imitation of the markings of the wings of the  
" natural insect." The article is formed of "gutta percha or  
" india rubber, or of a compound of these substances," or of  
" such a substance, and which "will resist the action of water."  
Metal dies are preferred, between which the gutta percha is  
pressed. Moulds may be made by pressure, or they may be made  
of glass (in the same manner as glass seals are now produced),"  
" and they are coated repeatedly with solutions of bleached india  
rubber or gutta percha, &c." "until the requisite thickness is  
" obtained."

[Printed, 3½d.]

A.D. 1852, November 27.—N° 893.

LOTSKY, JOHN.—"Improved playthings, hereby denominated  
" Pestalozzian gymnastic playthings."—*This invention is void by  
reason of notice to proceed not having been given within the time pre-  
scribed by the Act.*—It "consists in" "the formation or con-  
" struction of playthings for children, &c. of gutta percha or  
" other analogous substance, which shall differ from those usually  
" employed, in being thus constructed of such dimensions that  
" they shall exert the physical and mental faculties of the players  
" therewith, and yet their physical energies shall not be over-  
" taxed, by reason of such playthings being graduated in size,  
" &c. according to the age and presumed strength of the  
" players." Thus, "construct fortification work of considerable  
" size," so "cut up as to require some skill to put them toge-  
" ther." "After this fortification has been erected, it is to be  
" battered down." This is to be effected by gutta percha balls  
of large "diameter." "The emulating play will consist in who

246 INDIA RUBBER AND GUTTA PERCHA:

" can quickest erect and batter down the fortification." " In the same way make figures of bears and other wild beasts, and place them on large pedestals to be knocked down with the large balls aforesaid." Also, construct simple nine pins for the little children; " or, where room or expense is (not?) a consideration, not smaller than, say, two feet high." " In order to exercise the physical and mental energies at the same time construct large maps," &c.

[Printed, 2½d.]

A.D. 1852, November 27.—N° 897.

HOUGHTON, GEORGE.—" Improvements in the manufacture of college caps;" and these are, " forming the edges with vulcanized india rubber or other elastic material, the cloth or covering used being applied outside of such elastic material," and " employing two or more thin sheets of wood cemented together, the grain of the different sheets crossing each other, to obtain the property of strengthening the upper part of the cap, and keeping the whole in shape."

[Printed, 4½d.]

A.D. 1852, November 30.—N° 912.

JEFFS, WILLIAM.—" Improvements in manufacturing letters, figures, and ornamental work, and in the mode of attaching the same to wood, stone, iron, and certain other materials;" and these are, first, coating letters, &c. made of iron or other cheap material with sheet brass or other metal, by soldering or " cementing," or " by electroplating," or " with porcelain or cement."

Second, making letters, &c. with spikes. The spikes are attached to the cast metal as follows:—" After the pattern of the figure is withdrawn from the sand, the spikes are pressed into the sand, leaving the heads to project somewhat above the sand." The hot metal is poured into the mould.

Third, applying " gutta percha and papier mâché to the manufacture of letters and figures for shop fronts and other similar purposes."

Fourth, the mode of fixing such; and this is, as stated above, in what is termed the second improvement.

[Printed, 5½d.]

A.D. 1852, November 30.—N° 915.

CLARKE, SAMUEL.—“Improvements in lamps;” and these are, “employing vulcanized india rubber as elastic surfaces to receive the chimneys and other glasses, of candle and other lamps.” The gallery is made with three projections. “The projection has simply a notch or undercut part to receive the end of the glass, whilst the projections have each a piece of vulcanized india rubber fixed across or clipped.” “Hence, when the glass is in its place,” “the pieces of india rubber will have a tendency to hold the edge of the glass under the undercut part of the projection;” and thus will the glass “be retained in its place.”

[Printed, 54d.]

A.D. 1852, December 2.—N° 933.

ROTHWELL, JAMES.—“Certain improvements in looms for weaving;” and these are, applying “springs to the picking sticks of looms, whereby the injurious effects resulting from the shuttle entering suddenly the shuttle box are obviated, and less power is required for picking the shuttle from one shuttle box to the other, than in looms of the ordinary construction.” “Vulcanized india-rubber springs may be used when convenient.”

[Printed, 44d.]

A.D. 1852, December 3.—N° 946.

WARE, GEORGE, and FERNANDEZ, ALBERT HENRY.—“Improvements in the making of wedges or keys for holding or tightening the rails within railway chairs.”—*This invention is void by reason of notice to proceed not having been given within the time prescribed by the Act.*—It “consists in covering a material or materials with heated gutta percha, so as to produce one united mass in a wedge-form shape; which material or materials to be so covered consists either of wood inclosed within roofing or asphalted felt, or sand and ashes, or hemp and ashes, or cork cuttings alone, mixed with heated tar, so as to form a substance to be afterwards covered with gutta percha.”

[Printed, 24d.]



A.D. 1852, December 4.—N° 959.

MURDOCH, JAMES (*a communication*).—"An improved galvanic "battery;" this consists in the formation of voltaic batteries, by forming upon a surface "a non-conducting and non-absorbent "material, as gutta percha, wood steeped in oil, horn, or other "suitable material, ribs, or ridges, or grooves, and attaching to "or surrounding such ridges with, or fixing into such grooves, "plates, or hoops, or pairs, (formed of two dissimilar metals in "metallic connexion with each other,) the several hoops, or pairs, "or plates not coming into contact with each other, but being "arranged in the voltaic order, and so that the exciting fluid "may be retained between the pairs, either by capillary attraction between the pairs, or by inserting between the pairs, and "in contact therewith, pieces of an absorbent non-metallic "material."

[Printed, 8½d.]

A.D. 1852, December 4.—N° 960.

BENTLEY, JOSEPH.—"Improvements applicable to fire-arms;" and these are said to be applicable chiefly to that class "known "as revolvers;" and what is claimed is, "the catch or lever "placed in a mortice upon the top of the cock or hammer; the "rounded top of the trigger to give it an easy and certain "action; the bolt or catch on the end of the trigger spring to "hold the chambers securely in their position during the act of "firing; and the mode of screwing on the barrel to the pin or "axle upon which the chambers revolve, and by the large-headed "screw to the body or frame of the stock; and the particular "form of stock frame formed of one piece of metal; and, lastly, "the use or application of gutta percha and papier mâché to the "manufacture of side plates for the stocks of fire-arms."

[Printed, 8½d.]

A.D. 1852, December 7.—N° 987.

NEWTON, ALFRED VINCENT (*a communication*).—"An improved mode of transportation for the conveyance of letters, "packages, freight, or passengers from one place to another;" and this is effected by arrangements described. "Through air-tight cylinders, the pressure of the atmosphere behind a move-

“able plunger being used to propel the load, the air in advance of the plunger being exhausted. The plunger and carriages may be fitted with wheels or friction slides if desired, and made light of wood or other substance to obviate friction. The main cylinder through which the packages are transmitted is constructed of metal, stone, wood, or other suitable material, and is laid either above or below the surface of the ground, as nearly direct as may be from one point of the country to another with which communication is to be established.” “At the termini of the line, and also at the various way stations,” “station boxes” are used for the purpose of introducing the packages to be transported, and these boxes are capable of being closed air tight.” “The lip” being covered with india rubber or other suitable material.

[Printed, 10½d.]

A.D. 1852, December 9.—N<sup>o</sup> 1010.

HUNT, EDMUND.—“An improved screw propeller.”—*This invention did not proceed to the Great Seal.*—It consists in “constructing a screw with flexible and elastic blades, the essential object being that such blades may vary in obliquity according to circumstances, or may lie in a plane or planes parallel to the ship’s axis when the ship goes by wind alone, and that such propeller be entirely self-acting.” “And whereas, in previous arrangements of flexible screws, the necessary reversing adjustment is made by very complicated contrivances, the blades requiring to be set by means of some mechanism communicating with the interior of the vessel;” according to this “the required reversing action is produced simply by altering the direction of motion of the shaft, just as with an ordinary inflexible screw; catches or projections being fixed on the shaft near the blades, which secure and carry round the fore or after part of the blades, according as the shaft revolves in one direction or the other, the opposite end of the blade to that engaged by the catches being free to yield to the twisting action of the water. The screw blades are formed of two or more arms hung on the shaft by their centres, or passing directly through the centre of an enlarged boss; these arms may be simple rods, or they may be flattened out (more or less) towards their extremities into thin flexible plates, sliding on each other as in a fan, and

250 INDIA RUBBER AND GUTTA PERCHA :

“ being connected by slots and pins. In the former case, that is, when the arms are shaped as simple rods, the whole blade is covered with vulcanized india rubber or other elastic and flexible material, which forms a web between the rods. In the latter case, when the arms are flattened out, the india-rubber covering is not absolutely necessary, but it may be employed to protect the moving parts, necessarily minute, from the rustling action of the water.”

[Printed, 2½d.]

A.D. 1852, December 10.—N° 1019.

DERRINGTON, JAMES, and CHADWICK, JOHN.—“Improve-ments in cocks and valves for liquids and steam.”—*This invention is void by reason of notice to proceed not having been given within the time prescribed by the Act.*—It “consists in the use of a spherical valve adapted to a seat, and retained there against the pressure of the fluid, by means of a screw or other apparatus suitable for the purpose. The valve may be of metal or other hard substance, or of gutta percha, india rubber, or other elastic material.”

[Printed, 2½d.]

A.D. 1852, December 15.—N° 1061.

D'HOMME, PHILIPPE (*a communication*).—“Certain improve-ments in the manufacture of window blinds, curtains, and hangings,” by “printing in oil colors upon calico, silk, canvass, paper, or other suitable fabric, by means of zinc plates employed in a manner analogous to that of lithographic or zincographic printing.” The zinc plate is prepared and the design is fixed upon it in a certain manner. The cloth to be printed is dry, and in order to give “greater transparency to the cloth it is prepared before being printed by a solution of gum tragacanth.” “After the printing is completed, the cloth is covered with a thin coat of a solution of caoutchouc in turpentine on the opposite side to that which has received the impression.”

[Printed, 5½d.]

A.D. 1852, December 15.—N° 1062.

WALKER, SUSAN.—“Improvements in clogs and pattens;” and these are, rendering these articles more durable, &c. by covering their irons with gutta percha, india rubber, &c. The iron to be covered, &c. is surrounded with the material or materials, both iron and materials being in a heated state, and “subjected to “hydraulic pressure.”

[Printed, 2½d.]

A.D. 1852, December 15.—N° 1070.

DRESSER, CLEMENT (*a communication*).—“Improvements in “combining materials to be used in substitution of whalebone “and other flexible and elastic substances;” and these are said to be, first, “in the construction of the two machines by which” the “shelling and forming of the Indian canes” are effected. The first machine is an adjustment of two knives through which the cane is drawn. “This first machine takes off two sides of “the cane, the two other sides are removed by the second machine,” which is an arrangement of one knife through which the cane is drawn twice, one side being removed each time.

Second, “the impregnation of Indian cane, or other similar “fibrous substances, with caoutchouc, gutta percha, sulphur, “resins, and other waterproof substances to produce a substitute “for whalebone,” &c. The canes after forming are dyed, boiled, dried, and impregnated with solutions of gutta percha, &c. by pressure, afterwards dried, steamed, pressed, and finally “varnished.”

[Printed, 5½d.]

A.D. 1852, December 16.—N° 1081.

BELLFORD, AUGUSTE EDOUARD LORADOUX.—“A new system “of stoppering bottles and other vessels;” and this consists of “a cork or stopper of wood, metal, glass, or any other material, “to which is attached a piece of vulcanized india rubber, with “which the neck of the bottle is covered and around which it is “attached.” “This caoutchouc covering permits the liquid to “dilate itself or to contract” without the air coming in contact with the liquid. The bottle is filled, the cork is put loosely in, and the india-rubber tube is drawn over it.

[Printed, 4½d.]

A.D. 1852, December 20.—N<sup>o</sup> 1111.

WILKINSON, WILLIAM.—“Improvements in the manufacture  
“ of paper and pasteboard, and in the production of a substance  
“ applicable for veneers, pannels, and to many purposes to which  
“ gutta percha and papier mâché are applicable;” and these are,  
“ take the beards of barley, rye, and other grain which grows  
“ with a similar beard, and steep the beards, and mix them with  
“ bone, size, or other like glutinous matters, and pass the whole  
“ through rollers. The paper thus produced may be used, after  
“ being dried, as it comes from the rollers, or it may be bleached  
“ at any part of the process. In the manufacture of pasteboard,  
“ add a portion of bonedust and sawdust; for veneers, panels,  
“ &c., take sawdust of various-coloured woods, which, mixed with  
“ glutinous matters, forms an artificial board of various colours,  
“ and being passed between engraved rollers, or being submitted  
“ to pressure under an engraved or figured die, produces an  
“ embossed surface applicable as a veneer, and also as mouldings,  
“ cornices, picture frames, book covers, &c. &c. If pressed  
“ between plain rollers, a flat surface only will be produced.”

[Printed, 2½d.]

A.D. 1852, December 20.—N<sup>o</sup> 1114.

WATSON, CHARLES.—“Improvements in carriage and stable  
“ brushes.”—*This invention is void by reason of notice to pro-*  
*ceed not having been given within the time prescribed by the*  
*Act.*—“These improvements are effected by making brushes of  
“ that class denominated as carriage and stable brushes, with  
“ backs composed entirely of gutta percha or other analogous  
“ substance, whereby pliancy will be given thereto, the backs will  
“ not be injured by the water used therewith, and they will be  
“ generally rendered more useful.” “Take a piece of gutta  
“ percha, and perforate it with holes suitable to receive the ordi-  
“ nary bristle stops, the lower ends whereof fix therein; then  
“ cover the back with gutta-percha solution: or cement, and place  
“ thereon a covering piece of gutta percha, which will thus be  
“ firmly secured to the other portion of the back, also of gutta  
“ percha, and forms a brush as aforesaid.”

[Printed, 2½d.]

A.D. 1852, December 21.—N° 1128.

**MOSELY, EPHRAIM.**—"Improvements in the manufacture of "artificial masticating apparatus;" and these are, first, "interposing between the gum of the wearer of artificial teeth, and the plate or frame which carries the teeth, a layer or cushion of "india rubber." This is done by a layer of wire gauze coated with india rubber.

Second, "producing artificial gums having the appearance of "the natural gum" as follows:—Affix to the gold plate "a suitably moulded perforated plate or wire-gauze frame, composed of platinum or other non-oxidizable metal," and cover it "by means of a camel's-hair brush," with a coloured solution of india rubber obtained by dissolving the rubber in "chloroform, and mixing vermilion therewith," "laying coat upon coat until "a sufficient thickness is obtained."

[Printed, 5½d.]

A.D. 1852, December 22.—N° 1134.

**KINGSTON, JOHN FILMORE.**—"Improvements in obtaining "motive power by electro magnets;" and these are, first, in the "construction and arrangement of the parts of electro magnets;" and second, "in arranging two series of electro magnets and keepers in two rotatory engines, in such manner that the electric current, when acting on the series of magnets of one "engine, shall be cut off from the series of magnets of the other "engine." "The electro magnets consist each of several plates of soft iron (or nickel), bent so that the two parts become "parallel. These plates are arranged and secured by bolts or rods of brass, on a bed plate duly insulated; also, bolts or rods of brass duly secured at either end, are passed through the "ends of the bent plates near their poles; and the poles of each "magnet, and the poles of the neighbouring magnets, are kept "apart by means of gutta percha;" and, "by preference, wrap "parallel wires round and amongst the limbs of the several "magnets in place of using single wires, the several wires being "made into bundles, the wires of each bundle being in contact "with each other, but each bundle being insulated by the ordinary means used for single wires." "A number of these compound magnets are applied to a rotatory wheel moving freely

254 INDIA RUBBER AND GUTTA PERCHA:

“ on an axis; and on another part or wheel of the engine (affixed  
 “ to the axis) there are as many keepers as magnets applied; so  
 “ that when an electric current converts the iron plates into  
 “ electro-magnets, their keepers are attracted, and motion is  
 “ given to the axis and to the other parts in such manner that  
 “ the keepers of a corresponding rotatory engine on a different  
 “ axis are removed a distance from their magnets equal to the  
 “ distance through which the other keepers are attracted. The  
 “ gearing is arranged to cause the two rotatory engines to  
 “ revolve in the same or in opposite directions; and, by means  
 “ of discs formed alternately with conducting and non-conduct-  
 “ ing surfaces, the electric current is passed alternately to the  
 “ two engines in such manner that the magnets of one will be  
 “ simultaneously made when the magnets of the other are  
 “ unmade.”

Printed, 1s. 0½d.]

A.D. 1852, December 22.—N° 1137.

AYCKBOURN, FREDERICK.—“ Improvements in rendering  
 “ certain materials impervious by air or water;” and these are  
 “ preparing woven, felted, looped, and other similar fabrics, and  
 “ also leather, with a solution or preparation of india-rubber, or  
 “ with chouca, marine glue, or other suitable cement, and facing  
 “ the same with gutta percha, by rolling such woven, felted,  
 “ looped, or other fabric, or the leather, when so prepared, on a  
 “ cylinder, and by also rolling the gutta percha, in the form of  
 “ a thin sheet, on another cylinder, and unrolling the respective  
 “ materials from the two cylinders, when the materials are placed  
 “ in contact, and pressure is exerted to cause them to adhere.”

[Printed, 2½d.]

A.D. 1852, December 23.—N° 1142.

COUCHMAN, JOHN WILLIAM.—“ Safely fastening window  
 “ sashes.”—*This invention is void by reason of notice to pro-  
 ceed not having been given within the time prescribed by the  
 Act.*—In carrying out these improvements springs are employed  
 made of vulcanized india rubber.

[Printed, 4½d.]

A.D. 1852, December 23.—N° 1143.

**DEUTSCH, ALEXANDRE.**—"Certain improvements in treating "oil of colza and similar oils" so as to render it "suitable for "being advantageously employed for oiling wool in the process "of its manufacture, and also adapted for the lubrication of "machinery." The oil is heated in a pan, and kept near boiling from "three to four hours, more or less." "The oil is allowed "to settle for one or two days, more or less," and drawn off. "When oil so treated is to be employed for the lubrication of "machinery, and it is desired to diminish its fluidity, a solution "of cautchouc," obtained by boiling that substance in colza oil, is to be added, "or tallow, or other solid grease."

[Printed, 2½d.]

A.D. 1852, December 24.—N° 1154.

**MURPHY, JOHN LOWTHER.**—"An improvement in drawing off "liquids from barrels and other vessels," by which the liquid will be protected from the action of the air; and this is effected by what is denominated a "conservator." The conservator is made of cautchouc, vulcanized or otherwise, gutta percha, leather, felted or woven fabrics. The leather or fabrics coated with "solutions, such as of cautchouc, resins, and fats or oils." The conservator is placed inside the barrel. In one case it contains the liquor, and on drawing off the liquor air enters the barrel at the vent peg. Another mode is to attach it empty to the orifice of the vent peg. Again, "it may have the form of "half the barrel, and be cemented by its edge to the middle of "the barrel," and, occupying the upper half of the cask, "as the "barrel empties itself, the conservator turns itself outside in, and "when the barrel is empty, occupies the lower half of the barrel."

[Printed, 5½d.]

A.D. 1852, December 24.—N° 1157.

**BURCH, JOSEPH.**—"Certain improvements in passenger and "other carriages;" and these consist in constructing two wheel carriages, with bevel ends jointing together at the centre of each bevel end by a joint at the bottom and top peculiarly formed. The advantage is, "the capability of using large wheels to both



"carriages, whereby the draught is considerably lightened," and would allow of "a train of two or more wheel carriages" to "be used on common roads." The doors are placed at the bevelled ends, and a circular platform or step is arranged to form a step into both carriages when jointed together. Seats are placed along the roofs of these carriages, and awnings are fixed. Also in using "a series of vertical, steel, india rubber, or other springs across the carriage, between the axletree and the carriage body; and using horizontal drawing links for connecting and transmitting the draft from the carriage body to axle, and also for the purpose of preventing any lateral strain upon the vertical springs."

[Printed, 6½d.]

A.D. 1852, December 24.—N<sup>o</sup> 1162.

WILSON, JAMES GODFREY.—"Improvements in the construction of carriages and vehicles for railroads and common roads, parts of the said improvements being also applicable to parts of locomotive engines used on railroads."—*This invention is void by reason of notice to proceed not having been given within the time prescribed by the Act.*—The improvements are as follows:—

First, "in the application of a tyre, made or composed chiefly of whalebone."

Second, "in constructing the roofs" so that "the outer covering of the roof and the inner roof or lining" is "placed a distance apart, or so constructed that a free space (so far as practicable) is left between them."

Third, "in the application of gutta percha, formed upon a wire body, for panneling and interior fittings of carriages, as also for roofs of carriages or other vehicles. The wire or wire netting being introduced into the gutta percha, or being the foundation upon which the same is to be moulded or formed, gives to the same the strength of a fibrous material."

Fourth, "constructing and applying breaks" so "that the break is made to come in contact or impinge upon the inner or outer side of the rim of the wheel, or the outside of the flange instead as in ordinary breaks, being brought in contact with the edge or periphery of the wheel."

Fifth, "the application of an arrangement whereby the face of

the break, being a piece of soft iron, and being made a magnet by the ordinary arrangements and connexion with a galvanic or electrical battery, simultaneously with its being brought into contact with the side of the wheel, or flange of the wheel to which it was applied, attracts and holds the wheel."

Printed, 2½d.]

A.D. 1853, January 1.—Nº 1.

WILKINSON, WILLIAM.—"Improvements in taps and other apparatus for filtering and drawing off liquids;" and these are, first, in "manufacturing cocks, taps," &c., as follows:—"Take a quantity of molten glass, and press or coat it in suitable moulds." The plug of glass or metal "is formed separately," and "ground into the key way," and secured "by a metal nut."

Second. "The arrangements for admitting air into the interior of casks or barrels containing liquids to be drawn off." This may be described as follows:—A tube communicating with the interior is screwed into the barrel near to where the bung is in ordinary barrels. "A plug is passed through the upper part of this tube," "and has drilled in it a hole about the same diameter as the interior of the tube; to the plug is fastened a cord or wire; this is continued along the top of the barrel, and passed through an eye, and brought down in front through a second eye, and is finally secured to the plug" of the tap fixed in the cask. On turning the tap the string is partially wound round it, and the plug is drawn forward until the hole of the plug coincides with the bore of the tube; the air is then admitted. On closing the tap the plug is drawn into its place by an india rubber or other suitable spring, fixed on the opposite side of the tap to the cord, and attached to the barrel.

Other arrangements are given for drawing off liquids.

Third. A filtering vessel. The filter is connected with the tap or otherwise; it consists of a perforated cylinder filled "with perforated discs covered with one or more thicknesses of linen or other textile fabrics."

[Printed, 8½d.]

A.D. 1853, January 1.—Nº 2.

BENTLEY, HENRY. "Vulcanized india-rubber springs for trousers and breeches, with instructions to adjust the same."

258 INDIA RUBBER AND GUTTA PERCHA :

—*This invention is void by reason of notice to proceed not having been given within the time prescribed by the Act.*—It consists “of three springs, namely, two hip springs and one back spring, made of vulcanized india rubber and cotton of different colours to suit the material for which they are used; they are also made of different sizes.”

[Printed, 2½d.]

A.D. 1853, January 1.—N° 8.

JOHNSON, JOHN HENRY (*a communication*).—“Improvements in the manufacture of oils, and the treatment thereof for lubricating purposes.”—*This invention did not proceed to the Great Seal.*—It consists in “destroying the unpleasant smell of certain descriptions of oils, more particularly those produced from resin or analogous substances, and in the improving such oils so as to render them applicable to the lubrication of machinery. The purified oil has an unpleasant odour, which in some cases renders it disagreeable to use. This may be changed by the addition of alcohol, such as is obtained at an extremely cheap rate by an invention recently introduced in France by M. Bouis, being formed upon the residuum left after the obtainment of oleaginous matter from certain seeds. By the addition of a small quantity of caoutchouc this oil may be made applicable for the lubrication of rubbing surfaces in machinery, locomotives, waggons, &c.” The caoutchouc in its raw state is cut up and steeped, pressed, dried, and dissolved “in from 50 to a 100 times” its “weight of the oil, and after from 20 to 48 hours immersion or thereabouts the temperature is raised considerably, and kept at the higher degree by a hot water bath. By prolonging the time of immersion a lower temperature may be used. The slimy fluid thus produced serves to form the required mixture by adding the requisite proportions of oil.”

[Printed, 2½d.]

A.D. 1853, January 5.—N° 22.

GERARD, GUSTAVE EUGENE MICHEL. “Improvements in manufacturing and treating caoutchouc.” It is stated that this invention is based upon the discovery that caoutchouc in any shape submitted to a temperature of about two hundred and twenty degrees to two hundred and forty degrees Fahrenheit,

"during a certain time, is susceptible of receiving and retaining  
"greater extension than in its natural state." These improve-  
ments are said to be, first, the application of heat to caoutchouc in  
any form or shape for the above purpose.

Second. "The processes and machinery for the manufacture of  
"caoutchouc sheets, tubes, and threads."

Third. "The processes of printing and ornamenting caout-  
"chouc."

Fourth. "The manufacture of imitations of oil cloths and  
"leathe."

The caoutchouc, "either alone or mixed with dissolving or  
"coloring matters," is formed into sheets by passing it down  
between two rollers heated from 220° to 240° F. The sheets may  
pass over a third cylinder. The sheet is received on to an endless  
cloth. Tubes are made by "a hollow cylinder similar to those  
"used for manufacturing vermicelli or macaroni, heated from  
"212° to 240° F.; it is closed at the lower part by a perforated  
disc, "having a suitable mandril, and also heated by a current of  
"steam." "The caoutchouc in the cylinder is forced out through  
"the hole of the plate round the mandril." "The tubes are  
"received by an endless cloth." The caoutchouc is better fitted  
for the manufacture of sheets and tubes when mixed with "twenty-  
"five to forty per cent. of red or yellow ochre, chalk, oxide of  
"zinc," &c., "and ten per cent. of essential oil or waste caout-  
"chouc melted by the direct action of the fire." To "produce  
"hollow or relieve designs," a tissue containing the design is  
soaked in soapy water, and "placed above the sheet of caout-  
chouc;" "they are rolled round a cylinder or placed between two  
"plates and heated by water or steam" to the above temperature.  
To replace oil cloth or leather: A sheet of the caoutchouc is  
united with a light cotton tissue, and the caoutchouc surface  
ornamented as above described. Caoutchouc thread "required to  
"lengthen or reduce in size," is stretched "to its greatest natural  
length," and in this state is submitted to the above temperature.  
"For heating the caoutchouc thread a hot solution of carbonate  
"of potash" may be substituted for water or steam, "by which  
"the strength of the thread will be increased."

[Printed, 34d.]

A.D. 1853, January 6.—N° 31.

SHERINGHAM, WILLIAM LOUIS.—"Illuminating buoys and  
"beacons in harbours, roadsteads, and rivers;" and this is effected

## 260 INDIA RUBBER AND GUTTA PERCHA:

by "means of the combustion of gas, volatile spirits, or any other " suitable hydro-carbon in a lamp or lantern attached to the " beacon or buoy," producing "the daily ignition of the combustible material with the aid of an electric current." "The " required illumination may also be effected by the electric light." When illuminating with the aid of gas, the gas is conveyed " under water along the ground in a tube made of jointed metal " or of some flexible impermeable material, such as gutta percha " or india rubber, to a suitable lantern." The " insulated electric conducting wires " are layed down in a similar manner, although it is better to carry the wires outside of the gas tube to prevent corrosion, either to the wires or their covering. If naphtha or a similar hydrocarbon be burned in the lamp, the electrical arrangement for igniting it is the same as for gas. Messrs. Holliday's and Company's lamp is preferred above any other suitable lamp.

[Printed, 3½d.]

A.D. 1853, January 6.—N° 36.

WHINERY, ROBERT.—"Certain improvements in or upon the " manufacture and treatment of leather, either alone or in combination with other materials;" and these are—first, "in the " process of unhairing skins or hides " using "an hydrate or " sulphuret of lime." Second, "in preparing the 'pelts' for " tanning or curing," using "an alkali or acid, or both." Third, "in tanning, preserving, or curing them," using "an alkali with " bark, sumac, terra japonica, myrabolams, valonia, or 'divi divi,' " or the extract of any of the above, or tannin, or salt of metallic " oxide, or an acid, alkali or neutral salt, either separately or in " combination." Fourth, "for blooming or coloring," using "the acetate or any other soluble salt of lead, or chloride of " barium, or any other barytic salt dissolved with any suitable " coloring principle, and afterwards immersed in or washed over " with sulphate of soda or dilute acid." Fifth, "for filling the " pores of tanned sole or insole of leather as used for boots or " shoes" using "prepared gutta percha, india rubber, gum, gum " resin, oil, tallow, bees' wax, gelatine, tar, pitch, resin in solution, cement, or paste, for the upper leather as used for boots " and shoes using a partly saponified grease or 'dubbin,' rendered antiseptic by a salt or salts of metallic oxides or an acid." Sixth, "uniting, attaching connecting, or annexing hides, skins, " or 'pells,' leather, leather shavings, splits, or pieces of leather,

“ or for cutting them into strands, threads, or torn asunder by  
 “ mechanical means, combined with linen, cotton, woollen, hemp,  
 “ hair, jute wood, cork, grass, or sponge, or other fibrous mate-  
 “ rial, or textile fabric, or steel or iron filings, or small  
 “ metallic substances, or emery powdered, or wire, or metallic  
 “ strips or sheets, or india rubber, or gutta percha, or for a  
 “ solution of gutta percha or india rubber, or a spirit or an acid,  
 “ or gum, or gum resin, or oil, or gelatine, or for a solution,  
 “ cement, or paste, or of any of the articles either separately or in  
 “ combination, &c. ;” “ and for a prepared gutta percha and  
 “ leather sole that can be applied to boots and shoes, as an  
 “ ordinary gutta percha sole.”

[Printed, 3*½*d.]

A.D. 1853, January 8.—No 59.

PARKER, FRANCIS, and DICKS, WILLIAM.—“Improvements in  
 boots, shoes, and that kind of spatterdashes termed antigropelos.”  
 And these are, “making the ‘uppers’ thereof either partially or  
 “ wholly of elasticated leather or cloth, such as is known in the  
 “ trade as patent corrugated elastic leather or corrugated elastic  
 “ cloth, which in the case of an ankle or half boot is to be  
 “ applied to the sole in two parts with a seam over the instep and  
 “ behind the heel, or cut whole with a seam behind only; or  
 “ in case of a goloshed ankle boot to be attached to the golosh or  
 “ not, as may be deemed advisable; and in the case of the Wel-  
 “ lington, or Albert, or jockey boot or shoe, or antigropelo, to  
 “ the sole in one piece without any seam over the instep, but  
 “ with a seam at the back or the side, or both at the back and  
 “ side, and in boots with a tongue and back strap made of the  
 “ elasticated leather or elasticated cloth. Boots or shoes so made  
 “ will fit tightly to the ankle without having a gore or gusset of  
 “ any kind, and will admit of being taken off and put on the  
 “ wearer with little trouble or difficulty.” “Employing two  
 “ descriptions or classes of flexible elastic manufactures,” con-  
 “ sisting, first, “of a surface or portion of leather cemented on to  
 “ another surface of leather, or it may be on to a woven or other  
 “ fabric; and, secondly, of a surface of woven fabric cemented to  
 “ another surface of woven or other fabric. In each manufac-  
 “ ture the two surfaces are cemented together by the use of india-  
 “ rubber cement, there being thin and narrow strips or thread of

262 INDIA RUBBER AND GUTTA PERCHA :

"vulcanised india rubber at short intervals apart, and held distended and parallel to each other cemented between each two surfaces of such manufactures, and in such manner that when the india-rubber strips or threads are released they contract the manufactures into numerous small longitudinal plaits or puckers."

[Printed, 9½d.]

A.D. 1853, January 10.—N° 62.

DUNCAN, CHARLES STEWART.—"Certain improvements in rendering bottles, jars, and other like receptacles air and water tight, and for raising and measuring the liquid contents thereof;" and these consist "in the use and application of certain mechanical arrangements," which may be described as follows:—The body of a vessel or bottle "has a metal collar cemented to the neck." "This collar has a square threaded screw formed around it" for the purpose of connecting thereon a cover "which has a corresponding thread or screw formed therein, and there is a piece fixed to or formed upon the said cover, around which a ring or collar" "of gutta percha, caoutchouc, or cork, &c., is placed and securely affixed thereto," the "said collar being in fact the stopper of the bottle." "There is a screwed hole formed through the cover" "into which a fountain" resembling in shape a thistle funnel "is screwed." To the bottom of this fountain a piece "of cork, gutta percha, caoutchouc, or other suitable elastic material or composition is fixed;" an elongation as it were to the fountain. If the cover be unscrewed, then the space between the under side of the said cover and the surface of the liquid will be enclosed, and thereby cause a partial vacuum in the vessel, and the air will pass down the fountain and through the liquid into the space above the liquid, and on screwing the cover again the liquid will be pressed up the fountain. Should the quantity of liquid raised be more than is required "the surplus may be returned into the bottle by partially unscrewing the fountain." Modifications of the above are also described."

[Printed, 1s. 0½d.]

A.D. 1853, January 11.—N° 72.

THORNTON, JAMES, THORNTON, JOHN, and THORNTON, ALBERT.—"Improved nets and other textile fabrics to be used

" for gloves and other purposes, and for the machinery to be  
 " employed in the manufacture thereof." In this invention one  
 part relates to the making of " cords and other fabrics rendered  
 " elastic by india-rubber thread with a surface either wholly or in  
 " part of cut or uncut pile." The mode preferred is simply  
 " lapping one or more threads of chenille around the several  
 " interior or passive threads separately; for this purpose, the pas-  
 " sive threads being of india rubber." " And for producing  
 " broader fabrics, having a surface either wholly or in part of cut  
 " pile," preferring to use " two full sets of chenille thread, each  
 " thread of each set traversing round two of the passive threads,  
 " first one and then the other alternately, and in opposite direc-  
 " tion to the threads of the other set, the chenille threads being  
 " so inwrought wherever a cut-pile surface is desired."

[Printed, 1s. 0½d.]

A.D. 1853, January 12.—Nº 83.

HUDDART, GEORGE AUGUSTUS.—" Improvements in the  
 " manufacture of artificial leather."—*This invention is void by  
 reason of notice to proceed not having been given within the time  
 prescribed by the Act.*—Plates of steel or copper are provided with  
 a pattern " resembling in counterpart the graining of the leather  
 " which is required to be imitated." These are coated " with a  
 " solution of gutta percha or india rubber, either separate or  
 " combined, and colored with any suitable pigment if required,  
 " and when this coat is dry, apply a second, and so on, until a  
 " suitable thickness is obtained. When the solvent has evapo-  
 " rated, strip off the sheet thus produced," " or instead of this use  
 " gutta percha or india rubber, or a composition of these sub-  
 " stances, coloured as required, and reduced by heat or otherwise  
 " to a plastic state. This material subject, while in a soft state,  
 " to the contact of engraved surfaces, whether plates or rollers."

[Printed, 2½d.]

A.D. 1853, January 13.—Nº 95.

FIFE, GEORGE.—" Improvements in protecting vessels and  
 " exposed surfaces from injury or decay."—*This invention is void  
 by reason of notice to proceed not having been given within the  
 time prescribed by the Act.*—Its object is " to protect wood or iron



264 INDIA RUBBER AND GUTTA PERCHA:

"or other materials forming exposed surfaces from decay and corrosion," and it is said that it will "have this effect in all cases where a high temperature is not encountered." "It consists in the application of gutta percha to such surfaces, by means of any powerful adhesive matter. This may be either the gutta percha dissolved in naptha, or shell lac dissolved in the naptha. By this agency a perfect sheathing is produced, applicable to both wood and iron, and without the aid of either nails or rivets." "Should the sheathing for any particular purpose, by the application of the gutta percha in sheets, be inconvenient or inapplicable, the gutta percha may be applied in a liquid state. The gutta percha will be found to take very readily any paint or coloring."

[Printed, 2½d.]

A.D. 1853, January 15.—Nº 106.

VION, HIPPOLYTE CHARLES.—"Certain improvements in apparatus for refrigerating." This invention consists in the application of cold produced by the evaporation of liquids and liquified gas by the aid of mechanical means, and in the combination of apparatus employed. The apparatus is made up of a precipitating vessel described as "composed of a wooden tub and of a tub of gutta percha," pumps, and an "hydraulic piston," composed of an arrangement of copper and caoutchouc, &c. &c.

[Printed, 1s. 6½d.]

A.D. 1853, January 20.—Nº 144.

RIDDLE, WILLIAM.—"Improvements in ornamenting walls, ceilings, and other surfaces," and these consist in using glass, rolled or pressed in pieces which have raised figures," as "leaves or scrolls on the surface," and which are "in relief, embossed, uneven, or undulating." These may be ornamented with foils, &c., &c., or otherwise. "The arranging of stamped glass in patterns and designs is in itself not new, the same having been done for windows for churches," &c., but the object of this is to form an ornamental panel not admitting light." No particular mode of affixing the glass is claimed, but use has been made of "lengths of gutta percha warmed and pressed round the pieces when arranged in patterns on wood, the gutta percha being

affixed to the wood by the aid of a cement sold under the name of "chouca," which being melted by heat is used to assist in fastening the warmed and softened bands or strips of gutta percha along and around the edges of the glass on the wood, and which may be additionally secured by needle points hammered through the gutta percha into the wood, or by other fastenings, &c."

[Printed, 5½d.]

A.D. 1853, January 22.—Nº 166.

FIFE, GEORGE.—"Improvements in safety lamps, which improvements, or parts thereof, are applicable to other lamps."—*This invention is void by reason of notice to proceed not having been given within the time prescribed by the Act.*—It consists "in the use of double gauze for the chimney, so as to render the passage of flame impossible. The glass, which is similar to that used in Clamp's lamps, is effectually protected by an outer casing of 'talc' or 'mica,' which does not interfere materially with the light thrown out. The lamp is supplied with air from below, as in Stephenson's lamp, and all chance of firing through the perforations above the oil vessel is obviated by the use of a gauze disc." "In order to prevent the glass from cracking an elastic ring or washer of vulcanized india-rubber is interposed between the end of the glass and the metal surface, so that any expansion or contraction of the glass may be allowed for." "In the construction of lamps for binnacles or signals, perforated copper, instead of wire gauze might be used, and internal reflectors employed, so arranged as to throw the light wherever it might be required."

[Printed, 2½d.]

A.D. 1853, January 24.—Nº 171.

BRINSMEAD, HENRY.—"Reaping all kinds of corn." "The corn is cut by three or any other number of circular cast steel plates, divided into any number of cutters, or by cast steel blades screwed or rivetted on to circular pieces of sheet-iron; the cutters overlap each other, and revolve with great rapidity, being driven by a gutta percha rope, running in frog's-mouth pulleys in a serpentine manner, or by gearing, thereby turning the two outside plates one way and the centre plate the opposite way, and cutting with the greatest facility." "In front is a

266 INDIA RUBBER AND GUTTA PERCHA:

"fence or muzzle, similar to two combs, placed horizontally, one on the other, with the teeth joined at the points, but apart from each other, backward. In this opening the cutters act, the teeth holding the corn until it is cut, and securing the cutters from injury," &c.

[Printed, 6½d.]

A.D. 1853, January 24.—Nº 172.

HOLDEN, HOWARD ASHTON, BULL, EDWARD, and KNIGHT, ALFRED.—"A new or improved method of communicating between the guard and driver of a railway train."—*This invention is void by reason of notice to proceed not having been given within the time prescribed by the Act.*—It consists "in the use of a continuous speaking or signal tube, extending from one end of a railway train to the other." It is carried into effect in the following manner:—"Fix a tube of metal on the top, and near the edge of each carriage, the said tube extending the whole length of the said carriage," and "connect the said metal tubes together by means of india-rubber or other flexible tubes, the said flexible tubes extending from the metal tube on one carriage to the metal tube on the adjoining carriage." "The extreme ends of the said continuous tube are made of a bell shape, so as to give facility in speaking through them." "And in each of the bell-shaped ends a whistle or other signal is placed, the whistle or signal being made capable of easy adaptation and removal."

[Printed, 4½d.]

A.D. 1853, January 25.—Nº 189.

NEWTON, ALFRED VINCENT (*a communication*).—"Improvements in the manufacture of printing surfaces," and these relate first, "to a mode of obtaining stereotype plates from printing types." Second, "to preparing printing surfaces, containing autograph writings, drawings, and other like works." In carrying out the first part of the invention, "the employment of" a "gutta percha film for covering the face of the type, and preventing the moisture of the fresh coating from reaching the surface of the type" is claimed. The composition, a mixture chiefly of clay, paper pulp, and plaster of Paris, is spread on the face of the mould. A piece of cotton cloth is laid over this

composition, and with this cloth side downwards the mould is placed upon "the form of types to be copied," the types having been previously coated with oiled silk or thin sheet gutta percha. "Pressure is then applied, and when the composition is partially dried, the cloth is carefully removed, and pressure is again applied." "The gutta percha or oiled silk coating" is finally removed, and the mould is pressed upon "the naked type." In the second part of the invention, in preparing the surface of the plates, they are wiped "with the ball of the thumb or with gutta percha film over cotton."

[Printed, 4½d.]

A.D. 1853, January 26.—N° 195.

DAVIS, ISAAC.—"Improvements in optical and mathematical instruments." These consist in "a new application of the telescope," for "determining distances, and registering the state of the atmosphere, by the increase or decrease of the field of views, which increase and decrease is formed into a table or index to indicate and fortel the changes in the atmosphere." The mode of carrying out the above is described, and it is stated "to prevent injury by the action of the atmosphere to these and all other description of telescopes and optical instruments," "line the interior with leather, india rubber, and shellac, dissolved in spirits of wine or any other non-conducting and absorbing substance."

[Printed, 7½d.]

A.D. 1853, January 26.—N° 196.

CAZALAT, ANTOINE GALY.—"A new barometer and steam gauge."—*This invention is void by reason of notice to proceed not having been given within the time prescribed by the Act.*—It consists "in ascertaining the pressure of elastic fluids by means of a spiral wire spring, having its extremities closed by two parallel discs, and also having the spiral surrounded by caoutchouc, the air being exhausted. This part of the apparatus being inserted in a recipient full of mercury serves to determine the pressure of the fluids with which it may be in contact." "A manometer" is described formed "on the same principle as the above."

[Printed, 4½d.]

268 INDIA RUBBER AND GUTTA PERCHA:

A.D. 1853, January 28.—N° 215.

SCOTT, JOSEPH.—“Improvements in closing or stoppering “bottles, jars, and other receptacles,” and these are as follows: “A screw thread is cut or moulded on the inner surface of the “bottle neck or opening at the time of moulding or shaping the “bottle, and into this screwed neck or aperture a correspondingly “screwed stopper of glass, earthenware, wood, gutta percha, or “other material is entered.” This stopper is formed with an expanded head, in the under part of which “is a groove containing “an annular jointing piece of some soft elastic material, as gutta “percha, india rubber, canvas, or other substance.” “The mode “of constructing the shears or shaping apparatus for bottles “with an engaging and disengaging screw,” is also claimed the application and use in bottle shears of a centre or intermediate screw spindle for screwing the interior of the neck at the time of moulding the exterior thereof, and the system or mode of engaging or disengaging the same by the action of opening or closing the shears” is likewise claimed.

[Printed, 5½d.]

A.D. 1853, January 28.—N° 221.

BROOMAN, RICHARD ARCHIBALD (*a communication*).—“Improvements in cables,” and these consist in constructing a chain cable so as to “render it elastic in itself throughout its “entire length (or nearly so) by inserting therein at suitable “intervals swivel or other suitable form of links, which are made “elastic by the combination therewith of springs of india rubber, “or other equivalent waterproof elastic material.” In carrying out this invention, the swivel form of link is that usually employed. The socket piece of the link is provided with a circular aperture for receiving the adjacent link at one end, while the other “is a socket and oblong aperture for admitting the other parts “of the link.” In this aperture is “a cylindrical bolster of “india rubber, or other suitable elastic substance,” fastened by a nut over the shank which enters the aperture.

[Printed, 7½d.]

A.D. 1853, January 29.—N° 225.

ARCHER, WILLIAM.—“An improved mode or modes of preventing accidents by improved signals on railways, parts of

“ which improvements are applicable to blast furnaces.” In carrying out the above objects, reference is repeatedly made to the Specification of a former Patent granted to the patentee, N° 14,037, and among some of the improvements one is said to be in the working what the patentee now calls “ his patent bellows,” but then “ air receiver,” and which is now to be constructed “ in metal in the form of a cylinder with an air-tight piston, or with expanding galvanized india rubber sides, or with gutta percha, or a combination of these materials.”

[Printed, 6½d.]

A.D. 1853, January 29.—N° 239.

CONSTABLE, WILLIAM.—“ Improvements in transmitting motive power to machinery, and in regulating the action of rotary machines.” These are “ the employment of springs, whether made of metal, wood, caoutchouc, or any other elastic substance, between the oscillating flywheel and the working parts of the machinery connected with it wherever within those limits the springs may be placed, and also the use of levers, of varying powers of resistance, for the purpose of equalizing any variable force that may remain uncorrected in the use of such springs, however the said levers may be constructed and placed, or be contained in or be part of any roller or cane, or contained within any excentric toothed wheels, or any other form of application ;” “ to the correction of the irregular motions of machines derived from forces of regularly alternating changes of intensity recurring in short intervals of time, whether such forces be derived from steam engines or any other source of power.”

[Printed, 6½d.]

A.D. 1853, January 31.—N° 268.

CLARKSON, THOMAS CHARLES.—“ Improvements in hats, caps, and bonnets, which improvements are also applicable to other articles of wearing apparel.”—*This invention is void by reason of notice to proceed not having been given within the time prescribed by the Act.*—It consists, first, “ in the use or application of ‘ baste ’ in an unmanufactured state in the manufacture of hats, caps, and other coverings for the head,” and “ elastic brim.” Second, applying the same “ as a stiffening

270 INDIA RUBBER AND GUTTA PERCHA:

" material for coats and waistcoats, and also in parts of ladies' dresses." Third, "cementing a thickness of cork to hat and cap bodies on the inside of the body next the head lining."

The "baste," "which is a product of the palm tree, and is imported into this country usually as a wrapper for cigars," is cemented to the fabric "by means of a solution of shellac and water or spirits, or it may be a solution of india rubber or other suitable adhesive matter." Generally a coat is given to both the fabric and "baste," and they are pressed together with heat "by ironing or otherwise." The "baste" so united is "cut into proper sizes for the purpose, and built up into hats," &c., or the "baste" may be united without any previous preparation "to the fabric caused to fit closely to the figure (required) of the block."

[Printed, 3½d.]

A.D. 1853, February 2.—N° 282.

BELLFORD, AUGUSTE EDOUARD LORADOUX (*a communication*).—"A stoppering apparatus for bottles containing liquids, of which small quantities are generally poured out at a time."—*This invention is void by reason of notice to proceed not having been given within the time prescribed by the Act.*—It is composed of an india-rubber tube, "fixed by one of its extremities to the base of a conical top." "This base is pierced with two holes in which are fixed two small india-rubber tubes. These tubes are kept separate by a nob at the top of the conical top." To adapt this to a bottle the tube is passed over the neck of the bottle. "When the bottle is inclined" liquid comes out of one tube while air enters the other. To close the bottles, bring down and press the extremities of the tubes against the sides of the bottle, and pass a ring of india rubber over them.

[Printed, 2½d.]

A.D. 1853, February 3, N° 296.

DULAURIER, BENOIT.—"A new system to render boots and shoes waterproof without sewing or nailing whatever, and the said invention to be applied also to render waterproof hats, caps, and general hatting. My invention consists in the application of machines to the manufacturing of general shoemaking and hatting."—*This invention is void by reason of notice to*

*proceed not having been given within the time prescribed by the Act.*—It consists in employing three compositions, the first of caoutchouc and gutta percha, melted separately and afterwards mixed; second, a purified asphalte and marine glue; and, third, Monsieur de Coulène's putty, and pressure is employed by means of levers.

[Printed, 2½d.]

A.D. 1853, February 4.—N° 310.

ASBURY, JACOB VALE.—“Improvements in railway carriages.” The object is “to prevent concussion when contact between these “two opposing forces takes place.” “This principle is effected “by machinery placed in the framework of the carriage with “double action and direct horizontal motion, and possessing “several degrees of power, and which are called forth consecutively as the forces of impact and pressure increase, so that a “progressive and increasing resistance is transmitted from carriage to carriage throughout the train, and whether a train in advance is at rest or progressing with less speed, or two trains meet each other of different weight and velocity, the greater momentum will be carried onwards.” The object is “not abruptly to stop a train, but to transfer its motion until an equilibrium is established.” In carrying out the above, there are “three rows of cylinders, making twelve in number, packed “cylinders, and six spring packed cylinders within the frame of the “carriage, besides six spring-packed and cushion-capped buffer “cylinders.” These cylinders contain springs and packing or packing alone of india rubber or other elastic substance, and besides these cylinders “oblong shells are cast with the same containing india-rubber packing, gutta percha, and iron recessed “plates, consecutively or otherwise, to assist and allow the said “india-rubber packing to be compressed within the limit of the “final pitch of the springs.”

[Printed, 7½d.]

A.D. 1853, February 4.—N° 311.

EDGAR, WILLIAM.—“An improved boot, particularly suitable “for the use of emigrants and persons at sea.”—*This invention is void by reason of notice to proceed not having been given*



272 INDIA RUBBER AND GUTTA PERCHA:

*within the time prescribed by the Act.*—"Instead of making "waterproof sea and deck boots with the outer covering of leather "extending only to the instep," "make them with an outer "covering of leather extending above the ankle or further up the "leg of the boot, even to the top if required;" or "form the "outer covering of leather so as to extend just above the ankle," and beyond this "use sheet india rubber, waterproof cloth, or "waterproof fabric; and such boot may have an elastic gusset "in the leather part at or near the ankle or at any height that "may be required. All the seams of the boot are well secured "and waterproofed."

[Printed, 2½d.]

A.D. 1853, February 5.—Nº 319.

WOLLOWICZ, ANTOINE.—"Improvements in primers for fire-arms." And these are, "the use and application to primers of "fire arms of elastic or flexible straps made of any suitable material provided with holes, openings, recesses, or apertures, in "which the caps or primers may be lodged in such a manner "that they may be placed on the nipple of the gun or other "fire arm, and removed from the strap with facility when required." The strap, made by preference of vulcanized india rubber, has holes in it according to the number of caps required to be carried. The caps are inserted therein, and held by the elasticity of the material forming the strap "until they are "required to be removed therefrom."

[Printed, 4½d.]

A.D. 1853, February 5.—Nº 325.

NICOLL, HENRY JOHN.—"Improvements in garments for "travelling."—*This invention is void by reason of notice to proceed not having been given within the time prescribed by the Act.*—It consists in "placing in the back part of the skirts of pale-tots, coats, wrappers, or like garments, a bag or cushion, "which, when inflated with air, forms a seat similar to the air "cushion or seat used by invalids, and in doing this in such a "manner as to enable travellers to inflate the bag without "inconvenience or exciting observation." "In most of the pale-tots and other over coats, the back part of the skirts of the

“coat is not open, as in dress or frock coats, except a little at the end;” “place the air bag between the lining and the cloth, just over the opening; a small tube of india rubber extends from the air bag into a side pocket; thus it may be readily held to the mouth and inflated without taking off the coat.”

[Printed, 2½d.]

A.D. 1853, February 8.—N° 339.

ALLAN, THOMAS.—“Improvements in galvanic batteries.” And these “consist in a mode of arranging the elements of the battery, so as to cause the gases and liquids to circulate, and also in an arrangement for self-amalgamating the positive metals, whereby a current of greater force and constancy is obtained than by the modes now in use.” “When the battery is composed of silver and zinc, the zinc plate is placed in a grooved frame of gutta percha or other suitable material, and immersed or suspended in the cell, and in the groove at the bottom of this frame is placed a little mercury in contact with the zinc; the silver plate is bent round this plate frame sides and opposing both sides of the zinc plate.” “By these arrangements, the zinc plate being in contact with mercury, is always re-amalgamating itself, which prevents local action, whilst the formation of oxides in the cells is also prevented.”

[Printed, 2½d.]

A.D. 1853, February 10.—N° 359.

ASH, ROBERT.—“Improvements in stopping bottles and other vessels.” And these are “making a stopper of two parts, one to enter the neck of a bottle or other vessel, and the other to cover the opening of the part which enters the neck of the bottle or vessel. The part which enters the neck is tubular, and is coated with a yielding elastic substance (leather, gutta percha, &c.) on the outside, by which it will enter and fit tightly into the neck. Near the upper end of this tubular part is formed a flanch. Over this tubular part is placed a cap or cover, which is formed to fit the upper end of the tubular part of the stopper; and the cap is provided with a flanch to correspond with the other flanch, and between such flanches a cement is applied to fit the cap or cover, which, in some cases,

274 INDIA RUBBER AND GUTTA PERCHA :

" is lined with a yielding elastic substance," " leather, gutta percha, or suitable matters."

[Printed, 5½d.]

A.D. 1853, February 12.—Nº 369.

MELLISH, THOMAS ROBERT.—" Improvements in the construction and mode of closing scent and other bottles."—*This invention did not proceed to the Great Seal.*—It consists, first, " in constructing scent bottles of glass with large mouths for the convenience of filling, and closing the same with a hollow stopper open at the lower end, and perforated on the upper surface for smelling to, the escape of scent when not required being prevented by a flat glass plate mounted in a suitable cap or cover." " An opening for filling is provided at the opposite side or end of the bottle, closed by a stopper formed by placing two or more rings or discs of glass and indian rubber or cork alternately upon a central pin or axis. The discs of glass are made a trifle smaller than the neck of the bottle, so that the indian rubber or cork alone takes a bearing and forms a joint without any risk of sticking fast in the neck."

Second, " in the application of springs to the stoppers of scent and other bottles, so as that the springs shall maintain the stoppers in an open or closed position, and prevent their being detached from the bottle."

[Printed, 2½d.]

A.D. 1853, February 12.—Nº 371.

WINIWARTER, GEORGE.—" Improvements in fire arms." And these are, first, " the several arrangements and combinations of mechanism, together with the use of vulcanized india-rubber rings for closing the breech of fire arms and ordnance." The india-rubber rings are placed in circular grooves concentric with one another, turned in the end of the barrel, and also in the movable breech to prevent the escape of gases when the piece is fired.

Second, " the method of greasing the needle." In discharging the piece the needle is made to be thrust forcibly forward " through the percussion cap into the charge." The moveable breech, in being withdrawn to receive a fresh charge, forces the

needle to half cock, and in doing so passes it into a reservoir of oil formed in the back of the moveable breech, and closed by a stuffing box, "for the purpose of greasing the needle in order to prevent its corrosion."

[Printed, 10½d.]

A.D. 1853, February 12.—Nº 377.

PIDDING, WILLIAM.—"Improvements in the treatment of "oleaginous, fatty, or gelatinous substances, for purifying, decolorizing, compounding, or clarifying the same," and these are, in making soap, "distilling the oils or fats so as to convert them into the fat acids," "and then subjecting them to the action of a carbonated alkali, and subsequently adding a sufficient quantity of caustic alkali to fit them for use." For "bleaching, clarifying, and refining" "oils or fatty bodies," allow them to percolate through filters containing pure alumina, or hydrate of alumina, or mixtures of hydrates, co-mixed with any substances that renders the alumina or mixture somewhat adhesive, and less dense than it would be if used alone." "To effect this object gums finely pulverised, but not soluble, aniseed oil, or copal and sandarac in a similar state, or gutta percha rendered in a fluid state by heat, are employed." Solid fatty bodies are kept fluid by heat during the operation of filtering.

What is termed "mosaic soap" is formed by putting pieces so as to form a pattern together, and causing them to adhere by heat, afterwards varnishing them by gelatine, collodion, &c., which preserves their perfume.

Fat acids are also treated by boiling them with metallic oxides and water, forming them into a metallic soap, which is afterwards decomposed by "sulphuric or other cheap acid," and the fatty acids made into soap by carbonated and caustic alkali.

[Printed, 3½d.]

A.D. 1853, February 12.—Nº 378.

HADLEY, CHARLES.—"Improvements in the means of communication between the passengers, guard, and driver of a railway train, parts of which improvements are applicable to communicating on vessels." These are, first, "the use of flexible tubes of vulcanized caoutchouc, or other elastic material, with the mode of securing them, and the mode of connecting

"them for communicating on railways and on ships." "The tubes (two are preferred) may be fixed underneath or within the roofs of the carriage," "or underneath the bottom of the carriage," and are protected by a casing or otherwise, "each end terminating in a right screw thread firmly attached to and around the exterior of the tube." The connection of the tubes is formed by means of a loose screw threaded collar being screwed on one tube flush with the edge; the tube of the adjoining carriage is drawn or sprung to it; the screw threaded collar is then removed half way upon it, which completes the connection."

Second. "The use of flexible tubes" as above "with junction or branch tubes throughout their entire lengths, the mode of opening and closing the communication to each or either of the tubes in each department of a carriage, and the double turnplate collars." Each branch tube is fitted at the end with a mouth and ear piece supplied with a spring or lever, "and open only when in use, and these communicate with one of the tubes running the whole length of the train to the guard. Different modifications of these arrangements are given and claimed. Third "the application and use of tubular ropes," &c. The object "of this modification of the above is to combine for the especial use of the guard and driver a signal rope and signal tube in one and the same." The tubular rope is a combination of india rubber, gutta percha, or other elastic substance with wire or other substance, so arranged as to bind freely around a "wheel or in any direction required, but at the same time in the direction of their length, they acquire a rigid and inflexible character," and the construction of these "ropes of vulcanized caoutchouc with the series of metal thread-like wires," and "the same with an outside covering or coating to render them rigid," as described, is claimed. Other signals are described, with portions of the machinery required in carrying them out."

[Printed, 7½d.]

A.D. 1853, February 14.—N<sup>o</sup> 379.

NEWTON, WILLIAM EDWARD (*a communication*). — "Improvements in apparatus to be employed for veneering surfaces," and these are,—First, "the mode of pressing veneers on to surfaces." Second, "applying the fluid in a heated state to make

"pressure." These may be described as follows:—A strong box, of any form, of metal or wood, &c., has a top "formed of a sheet" of vulcanized india rubber, or other flexible waterproof substance, "firmly attached all round to the upper edges." "The edges of" the box are provided with vertical screws for holding down and "securing a cap plate," or "if desired to force it down on to the" flexible sheet." The box is provided with pipes for supplying in preference hot water, and likewise for drawing it off. The box filled with hot water, the article to be veneered is coated with glue, &c., the veneer is applied, and the article "is put on to the flexible" cloth with the veneer on the cloth." The cap plate is then put over the article, and secured with nuts. Water is forced into the box by pressure. The pressure is continued till the glue is set."

[Printed, 6½d.]

A.D. 1853, February 14.—N° 383.

FONTAINEMOREAU, PETER ARMAND LE COMTE DE.—  
"Improvements in the manufacture of tiles for roofing."—*This invention is void by reason of notice to proceed not having been given within the time prescribed by the Act.*—It consists in "constructing tiles having a flat surface with two channellings, which divide it in nearly five equal parts. The lower and upper ends of the tile are provided with rims of about three fifths of an inch; one of these rims projects upwards, the other downwards, and their clamping together prevents the rain and snow from oozing between the jointed tiles. Each of the tiles is provided on its left end with a projecting rim, and on the right end with a tapering channel, into which the rim of the lower tile fits, to make a perfect joining. The channeling covers the jutting out rim, thereby leaving a sufficient space for the defects arising from the warping or cooling of the tiles. The tiles can be constructed of cast iron, plastic clay, gutta percha, or of any other suitable substances."

[Printed, 4½d.]

A.D. 1853, February 15.—N° 395.

NORMANDY, ALPHONSE RENE LE MIRE DE.—"Improvements in the manufacture of articles made of gutta percha;" and these are, first, "decolorizing gutta percha by means of

"animal charcoal." The gutta percha cleaned by known means is dissolved by preference in bisulphuret of carbon, and the solution is filtered through animal charcoal. The vessel with the solution is placed above and connected with a vessel containing the charcoal, the charcoal vessel again is connected with a receiver, and the receiver and vessel with the solution are connected together by a tube which enters into the upper part of each.

Second, "the manufacture of films or layers of gutta percha," as follows :—Pour the solution obtained above into a vessel, for example, a bell jar, which move about until its sides are completely covered, drain the excess of the solution off. On the evaporation of the bisulphuret of carbon, the sheet or film readily comes off.

[Printed, 5½d.]

A.D. 1853, February 16.—N° 406.

SY, EDOUARD.—"Improvements in book-binding;" and these consist in "making the backs of two or more parts longitudinally, and applying steel or other springs to the back in order that books (particularly large ones) may open and close more conveniently;" springs of caoutchouc may be used; an oblong piece, with an eye at each end, with hooks in them, is shown.

[Printed, 5½d.]

A.D. 1853, February 16.—N° 410.

NEWTON, ALFRED VINCENT (*a communication*).—"Improvements in the manufacture of printing surfaces."—*This invention did not proceed to the Great Seal*.—It consists "in mixing gutta percha and india rubber with metals or the oxides of metals reduced to a granulated state," and "manufacturing such compounds into moulds or matrixes, and into stereotype plates or printing surfaces." "The metals or oxides of the metals" are peroxide of iron, peroxide of antimony, or the two combined; also copper oxide and the oxides of lead and zinc. In cases where the composition is required to keep for a long period it is desirable to use india rubber and gutta percha combined." "When the metallic substances above enumerated are used, the composition is capable of being worked up again and again for the purpose of being remoulded; but when this is not required, *plumbago*, or the flowers of the earth (as clays, ochres, and

“ the crude metallic ores of zinc, tin, lead, copper, iron, antimony, &c.) may be mixed in with the plastic gum, and the flowers of the metals proper, and of earthen and glass ware may in like manner be employed to produce a composition fit for the manufacture of printing surfaces. The composition prior to being used for taking the impress of any device, which is afterwards to be printed, is rolled into sheets by means of heated rollers, and when still in a plastic state it is brought into contact with the surface, the counterpart of which it is intended to receive,” &c.

[Printed, 2½d.]

A.D. 1853, February 21.—N° 442.

PIDDING, WILLIAM.—“Improvements in coverings for the feet of bipeds and quadrupeds;” and these are, “instead of solid soles” to boots and shoes “make them hollow, and of india rubber or gutta percha filled with liquid,” by preference oil, because of its lightness, although when great lightness is required they are to be filled with air. To “cause the india-rubber sole-casing to retain always (except when in use, and when resting on uneven surfaces, such as gravel, stones, &c.), its shape by sewing throughout its surfaces numerous india-rubber threads; and to prevent the oil or other liquid or air escaping where the india-rubber threads have been sewn,” give both top and bottom of the soles numerous coatings of a solution of india rubber, gutta percha, or compound thereof, allowing each coating of such solution to dry before another is placed over or on to it.”

[Printed, 5½d.]

A.D. 1853, February 21.—N° 446.

BARTON, BENJAMIN.—“An improved bath, which can also be used as a life boat.” This is effected by combining a collapsible metallic framing with a lining or covering of any vulcanized caoutchouc or suitable waterproof fabric “fitted thereto, so as to be capable of being folded into a small compass,” the lining being either single or double, and capable of being inflated.”

[Printed, 5½d.]

A.D. 1853, February 21.—N° 449.

WILKINSON, WILLIAM.—“Improvements in the manufacture of ropes, bands, straps, and cords;” and these are as follows:—



“ Take a core of gutta percha, or other waterproof material, either solid or hollow, and plait or braid round it strands of hemp, silk, or metal wire, or strips of leather, or other protecting material, which can be laid on in a plaiting or braiding machine.” “ For flat bands and straps,” “ cover a flat, solid, or hollow band of gutta percha or other like material with plaitings or braidings of hemp, silk, or metal wire, or strips of leather, or other protecting material.” “ For ropes or bands where additional strength is required,” “ combine several cords, made as before described, as a core, and plait round them strands of wire, hemp, or other like suitable material, which can be laid on by a plaiting machine.” “ Should it be desired, the threads of hemp or such-like material forming the strands may be passed through a water-proofing material, or the ropes after being manufactured may be waterproofed, in order to render them impervious to wet or moisture.”

[Printed, 2½d.]

A.D. 1853, February 22.—No 452.

WINIWARTER, GEORGE.—“ Improvements in the manufacture of fire-arms.” And these consist in “ substituting for the ordinary wooden stock, stocks made from sheet iron, wrought into the required shape, or from cast iron, covered or not with gutta percha, or with board made from straw pulp, or with some other similar material capable of being moulded into the required shape.” Or “ form the stock from a plate of sheet iron, cut or stamped to the proper shape, and attach on each side of it similar shapes of gutta percha or other suitable material, so as to give to the stock its requisite form and substance.”

[Printed, 2½d.]

A.D. 1853, February 24.—No 465.

WALMSLEY, HENRY, and CRITCHLEY, THOMAS.—“ Improvements in machinery or apparatus for retarding or stopping railway trains; which machinery or apparatus is also applicable as a signal or communication from one part of a train to the other;” and these are “ The method of forming a continuous connexion from one carriage to the other, and of applying the breaks and of communicating signals.” The breaks now in general use are adopted, “ but in applying them to all the wheels a double screw is used;” “ or an ordinary single screw acting

" upon a strong spring, extending from one break to the other, under and across the carriage frame, forces each break on its respective wheel simultaneously." To maintain the connexion of the breaks from one carriage to another, a rod or shaft is fixed longitudinally under each carriage with slots at each end, into which work compound universal joints." In these arrangements a very strong piece of india-rubber tube forms a spring. To communicate signals, fix "a vertical shaft to the engine or tender, and connect it to the shafts above mentioned by mitre wheels," &c.; to this vertical shaft fix a spring lever, so that when it is moved by turning the shaft round it will strike a bell or other convenient signal; the shaft is turned whenever the wheel is turned to put on the breaks.

[Printed, 5½d.]

A.D. 1853, February 24.—N° 467.

JOHNSON, WILLIAM (*a communication*).—"Improvements in the treatment or manufacture of caoutchouc." "First, to the treatment of the raw juice of the caoutchouc tree in such manner that the juice shall remain in a fluid state without deterioration. Second, to the after treatment of such fluid matter for the production of a new article, or raw material of manufacture. Shortly after the milk or juice is collected it is strained, and has then added to it a quantity of the concentrated liquor of ammonia, or other ammoniacal matter, or any combination of nitrogen and carbon." "The mixture is then well mixed, when it will remain in a white fluid state, capable of transportation and use as a preserved material, if kept in air-tight receptacles." "For the production of a new article of manufacture from this composition, it is run out on a suitable surface, and submitted to slow evaporation."

This Patent was assigned by William Johnson to Samuel Thompson Armstrong, and leave was granted to him to file along with the specification a Disclaimer, No. 467\*, in which the matter printed above in italic is disclaimed.

[Specification of Patent, 3½d.; Disclaimer, 2½d.]

A.D. 1853, February 25.—N° 477.

SYMINGTON, WILLIAM.—"Improvements in preserving milk and other fluids." These are as follows:—A tin vessel has a

282 INDIA RUBBER AND GUTTA PERCHA:

nipple or short tube on the top, in preference formed of lead, a bent tube with a tap, has a socket end "of an elastic material, such as vulcanized india rubber to make it air tight," when "pressed in contact with the nipple or short tube." The milk, &c. is heated in a vessel with a steam jacket. A small quantity of water is evaporated in the tin vessel; the bent tube passing into the milk is pressed upon the nipple and the tap opened. On withdrawing the heat from the tin vessel, a vacuum is produced in it, into which the fluid flows. "The nipple or short tube is then to be hermetically closed by causing the nipple to be compressed and the end soldered."

[Printed, 4½d.]

A.D. 1853, February 26.—N° 496.

DUNDONALD, Earl of, Admiral.—"Improvements in producing compositions or combinations of bituminous, resinous, and gummy matters, and thereby obtaining products useful in the arts and manufactures." These are "increasing the durability of gutta percha, caoutchouc, and other gums, deposited in humid places, by means of their admixture or coating with unctuous oil of petroleum or tar," and also the forming of compounds of these gums "with shellac or other indurated and brittle gums and resins."

[Printed, 2½d.]

A.D. 1853, February 28.—N° 505.

LISTER, SAMUEL CUNLIFFE.—"Heating and making cards." First. Making "the rollers or card surfaces that receive and work the wool from the feed-rollers of iron or other metal," and fixing the teeth in brass or other suitable metal." "The form of the teeth may be varied," but the "roller and teeth patented and known in England as Calvert's" is preferred.

Second. Making the teeth for cards with "one edge of the wire thicker than the other;" or "in any way made out of wire not being round, so as to give more strength and a finer point than can be obtained from the round wire now in use." These cards should not have "less than 150 points to the inch, and they should be set in india rubber."

[Printed, 2½d.]

**AIR, FIRE, AND WATER PROOFING.** 283

A.D. 1853, March 1.—N° 508.

**BETHELL, JOHN.**—“Improvements in preserving wood from decay.”—*This invention is void by reason of notice to proceed not having been given within the time prescribed by the Act.*—These improvements are “the preserving wood by first charging it with the solution of any salt in water that has the property of coagulating bituminous matters, such as the sulphates of zinc or copper, or chloride of zinc; then drying it by artificial heat in a drying house, so as to expel all surplus or uncombined water, and then covering it with a waterproof covering, so as to prevent the wood re-absorbing moisture, and for which purpose” “tar of any kind,” “or melted pitch, or melted bitumen, or melted rosin, or any description of paint or varnish, or a solution of pitch or rosin, or caoutchouc or gutta percha, in any spirit or oil, as linseed oil, or any combinations or mixtures of these materials, or of any other materials that will make waterproof covering to the wood.”

[Printed, 2½d.]

A.D. 1853, March 1.—N° 512.

**ROWETT, WILLIAM.**—“Improvements in making paddle wheels for vessels propelled by motive power, which is called ‘the cylinder paddle wheel;’” these are, “making the floats of a cylindrical form, either solid or hollow, or shaped to any polygon form of any shape that may be described, either within a circle or an ellipse, and of any dimensions that may be required for the use of vessels propelled by any description of motive power. Also making any solid or buoyant float that may be lined within or without with any air-tight material, such as gutta percha, oil cloth, or any other article that may be applied to the float” “for making it air and water tight;” or “the float may be made hollow, built with the wheel, and open at the extreme top, not actually air and water tight.”

[Printed, 5½d.]

A.D. 1853, March 3.—N° 531.

**HUMPAGE, CHARLES.**—“The application of certain materials to the manufacture of coffin furniture.” These materials may consist of “paper, paper pulp, woven fabric, and gutta percha,

" suitably embossed, gilded, silvered, or otherwise ornamented, for the purpose of lace, handle plates, breast plates, and other ornaments of coffins." When these articles are required to be waterproof, they are " prepared with suitable waterproofing materials which may be used with proper colouring matters at the same time." If paper is used several sheets are pasted together; but it is preferred to use pulp. If fabrics are used they are to be well stiffened," but in preference they are " coated with a layer of paper pulp " on one or both sides. When gutta percha is used it is " pressed into moulds."

[Printed, 2]d.]

A.D. 1853, March 5.—N<sup>o</sup> 561.

HIRST, JOHN, junior, and MITCHELL, WILLIAM.—" Improve-  
ments in stretching fabrics."—*This invention did not proceed to the Great Seal.*—It consisted in causing fabrics " to travel over the peripheries of two drums or pulleys, each one of which receives one side of the fabric, and which are so placed as to be inclined from each other at a moderate angle. A gutta percha or leather endless band presses against a portion of the periphery of each drum, so as to keep the selvages of the cloth in contact with them; and the drums are capable of adjustment with respect to each other, so as to enable fabrics of different widths to be stretched in the same machine. On leaving the drums the fabric passes between a pair of rollers pressed together, and revolving at a greater speed than the drums, and according to the excess of the speed of the pressing rollers over that of the drums so will be the extent of stretching action, to which the fabrics will be subjected in the direction of their length, after having been stretched in the direction of their breadth by the action of the drums or pullies."

[Printed, 2]d.]

A.D. 1853, March 7.—N<sup>o</sup> 575.

CAROSIO, AUGUSTINO.—" A hydro-dynamic battery, or new or improved electro-magnetic apparatus, which, with its products, are applicable to the production of motive power, of light, and of heat." The cells of the battery are cylindrical, and are " formed of gutta percha, earthenware, or other sure conductor or bad conductor of electricity." " In order to keep the cells

"supplied and to renew the acid in them," a cistern "is placed above the apparatus and connected by pipes," and cocks with longer pipes, "which convey the acidulated water to the cells;" arrangements are made with other cocks "for regulating the escape of the acidulated water, and also pumps are worked by engines, which raise the acidulated water through suction pipes, and delivers it through other pipes; and to prevent a continuous supply being established by these pipes into the cistern a rocking bucket, "made of gutta percha and divided into two compartments, is placed under these pipes." "The streams of acid are thus insulated from the cistern," and "when one compartment of the bucket is filled, it tips over suddenly and discharges its contents into the cistern," "the other department then fills, and the bucket tips back again and so on." Similar buckets are arranged elsewhere, and for a similar purpose. "The pipes and cells which contain or are in contact with the acidulated water, are made of gutta percha." "When the pressure in the generating cells is too great to be safely borne by the gutta percha alone, each cell may be enclosed in a sheet-iron case." (See "Abridgments of Specifications upon Electricity, Magnetism," &c.)

[Printed, 1s. 2½d.]

A.D. 1853, March 8.—N<sup>o</sup> 584.

LISTER, SAMUEL CUNLIFFE.—"Improvements in machinery used in washing wool;" and these are, as follows: "The wool, when immersed in the water, requires considerable labour to lift it from the liquid, and to place it upon the sheet, which is usually fixed about one foot above the level of the water in the bowl." "In order to lessen the labour attendant upon raising it out of the water" "fix the roller round which the endless sheet moves below instead of above the surface of the water; and to prevent the wool from slipping off the sheet" "fasten thin laths of wood a few inches apart across the sheet, which will be found materially to aid in carrying it to the expressing rollers. All that is then required of the washer is to push the wool forward on to the sheet, and as it moves along it will conduct the wool on its surface to the expressing rollers, thus saving all the labour of lifting it out of the water." "Cover washing rollers with vulcanized caoutchouc," "as hard as possible,

286 INDIA RUBBER AND GUTTA PERCHA:

"nearly like wood." "It should be made into rings or washers of about one foot in diameter, and two inches broad, and about half an inch thick, and placed upon an iron boss or roller; and then several of these rings should be pressed together as close as possible, the number depending upon the width of the roller required."

[Printed, 2½d.]

A.D. 1853, March 9.—Nº 594.

BLACKWELL, SAMUEL.—"An improved strap or band for connecting together certain parts of harness and saddlery, applicable also to other purposes where straps or bands are used," by combining "india rubber or vulcanized india rubber with hemp or other strong material," as follows:—Take a piece of sheet india rubber of the required size to form the elastic portion of the strap or band, "and bevil the edges thereof in opposite directions; then take a piece of plaited hemp, or other suitable strong material, plaited as a tube, by any of the known means, and pass a mesh or flat piece of iron or wood" through said plaited tube, taking care that the width of the mesh is such as to stretch the hempen plait so as to contract the length thereof to about one half, or in any other proportion according to the amount of elasticity which it is desired to give to the india rubber;" and "attach the ends of said hempen plait to the india rubber by solution, such as is used for uniting india rubber, by besmearing the hemp all round the ends for about half an inch;" and having done this, bring the two bevilled edges of the india rubber together, "and unite them with solution by exerting moderate pressure thereon, and when the solution has set or become solidified, so as to connect the ends of the hempen plait securely to the india rubber," then remove the mesh, or it may be removed before fixing the plait to the india rubber, after which the india rubber is submitted to the vulcanizing process, in the manner usually practised." "If it is desired to connect the india rubber to a buckle or link," "employ bent plates, and serrate or notch their inner surfaces near the ends, in order that when such plates are connected to the india rubber (which may be effected by rivetting) the serrated or notched portions will hold the india rubber firmly, and prevent it from tearing at the holes

"through which the rivets pass," and "further strengthen the ends of the india rubber by affixing thereto pieces of linen, or other suitable woven material." If it is desired to connect the india rubber to a piece of leather or other material "then employ plates of metal" "serrated as before stated and rivetted together."

[Printed, 8½d.]

A.D. 1853, March 9.—N° 595.

BLACKWELL, SAMUEL.—"Improvements in saddlery and harness;" these are, first, constructing "dumb jockeys of gutta percha, or of gutta percha and wood combined, or of gutta percha, wood, iron, and leather combined." Second, applying to dumb jockeys "elastic reins and an elastic crupper;" these are formed "of india rubber or vulcanized india rubber, hollow, with string or webbing fixed inside the same." Third, applying to harness "springs of india rubber or vulcanized india rubber, either separately or in combination with string or webbing." Fourth, making a crib-biter "either wholly of gutta percha or of gutta percha in combination with leather and iron, instead of making the same of iron and leather only, as usually practised."

[Printed, 10½d.]

A.D. 1853, March 9.—N° 598.

PIDDING, WILLIAM.—"Improvements in treating sheets of caoutchouc or gutta percha, so as to render the same fit for ornamental coverings." These are as follows:—Take "a sheet of india rubber (caoutchouc), of such thickness as" may be required; stretch it, by any known means, to from eight to sixteen times (more or less as desirable) its original superfi ce." "Then print thereon a design or pattern, by any mode of printing, whether block printing or by cylinder. This design or pattern is made to show on its surface equidistant dots, or dots printed according to the design to be used." "Each of these dots must be perforated by any known means." "Into each of the holes perforated in the caoutchouc as aforesaid" "introduce a stud, or other formed substance, angular, sexagonal, octagonal, or otherwise shaped, of any convenient size, or of any suitable material, as electro-plated substances, silica, glass, glazed metal,



288 INDIA RUBBER AND GUTTA PERCHA:

“ metal, or other substance. On withdrawal of the stretching press or frame, the sheet of india rubber will collapse to, or nearly to, its size before stretching.” “ This fabric will be found fit for covering shoes, boots, ottomans, carpets, ornamental hangings, and for useful and ornamental purposes.” “ Closer adhesion of the caoutchouc and ornaments ” is effected “ by boiling the fabric in water, where desirable.” “ Or instead of studs,” “ insert into the holes aforesaid threads of any material, drawn as minutely as possible, previously soaked in gelatine, or any proper adhesive substance, and allowed to dry; then cut into the required lengths.”

[Printed, 3½d.]

A.D. 1853, March 10.—N° 612.

COCHRANE, WILLIAM ERSKINE, and COCHRANE, WILLIAM MARSHALL.—“ Improvements in girths or pads for retaining saddles in their places.” These are “ interposing a strap or piece of vulcanized india rubber at the middle or central part of a pad, and two hooks in the upper surface, which prevent the saddle from going forward.”

[Printed, 4½d.]

A.D. 1853, March 14.—N° 634.

STAITE, WILLIAM EDWARDS.—“ Improvements in apparatus for producing and applying current electricity, parts of which apparatus are applicable for obtaining and treating certain chemical products resulting from electrolytic action.” Of several improvements detailed (see “ Abridgments of Specifications upon Magnetism, Electricity,” &c.) one is “ the construction of the cells of galvanic batteries, with tubes at or attached to their bottoms, combined with the means whereby the same are charged and discharged.” These cells “ are fitted losely side by side into a vessel or vessels, preferred to be of glass or earthenware.” “ At the bottom of such vessel is flatly laid and cemented a stout sheet of vulcanized india rubber; melted sulphur will answer very well as a cement for this in most cases. The cells are so fitted to a frame that they can be simultaneously raised and lowered, say one or more inches. The mode of charging the said cells is (they being raised, say one inch simultaneously,) to fill the said outer vessel with the exciting fluid, and allow it to

“ascend into the glass cells until they are nearly full: the frame-work carrying the cells is then lowered, and the ground flat end of the tubes, pressing on the vulcanized india-rubber bottom, closes the tube, and prevents any circulation of the electric power other than through the regular circuit.” “To discharge the said cells simultaneously they are lifted up as before, and the outer vessel, and consequently the cells, may then be discharged into any convenient receiver. Such cells may be furnished with valves, or any other means of discharge which may be found more convenient; or a flexible tube of vulcanized india rubber may be attached, to the bottom or bottom side of the said tube, and the other end of the said flexible tube attached to a nozzle, which nozzle communicates with a channel or vessel, which may be made sufficiently long to extend to any number of cells in series: and by elevating the said channel, with the tubes attached, to the top level of the cells, the whole of the said cells may be charged or discharged simultaneously by elevating or lowering the said channel.”

[Printed, 94d.]

A.D. 1853, March 14.—N° 636.

BURTON, BENNETT ALFRED, and BURTON, HENRY MORTIMER.—“Improvements in the mode of manufacturing casks, vats, and other like vessels, and in the machinery or apparatus to be employed for such purpose.”—*This invention did not proceed to the Great Seal.*—One of these improvements is said to be in the “machinery for gathering the staves round the heads and depositing the hoops upon each end of the cask.” For this purpose “two disks” are “supported in such manner as to be capable of adjustment as regards the distance from each other. Each disk is made with a hollow chamber at the back, and through each disk there are holes drilled.” “Each of these holes is surrounded with a ring of vulcanized india rubber,” “thus forming a series of cells, from which the air can be exhausted by means of an air pump, provided with a receiver, from which there are pipes communicating with the hollow chamber at the back of each disk.” “By this arrangement” “the heads of the casks marked” “are placed against the disks, and the air exhausted from the cells” “by forming

290 INDIA RUBBER AND GUTTA PERCHA:

" a communication with the receiver," "the heads will be firmly attached to the disks."

[Printed, 4½d.]

A.D. 1853, March 16.—N° 656.

NICKELS, EDWARD.—"Improvements in preparing lubricating matters;" these are, "employing india rubber and gutta percha (together or separately), combined by heat with oily and fatty matters for the purpose of lubricating the moving parts of machinery." "Tar, pitch, or bituminous matters may be added." The india rubber and gutta percha is "rolled or pressed into thin sheets or films, placed together or separately in any suitable vessel, together with sufficient oil to cover them, and heat gradually applied thereto, which should be raised to the boiling point, and continued till the india rubber or gutta percha are dissolved, when a further quantity of oils or fatty matters, and other matters, if any are to be used, may be added and combined therewith, without the further addition of heat beyond what is necessary to melt any fatty matters which may be added. The matters in all cases are to be well mixed by stirring when in the fluid or melted state." "A great variety of compounds may be made in this manner."

[Printed, 2½d.]

A.D. 1853, March 21.—N° 696.

STATHER, JOHN.—"Improvements in printing;" these are, first, "of a mode or modes of producing blocks, moulds, or forms for that description of printing commonly known as block or surface printing," "by taking impressions in a material capable of being formed or moulded in the requisite manner from corresponding but inverted or reversed letters, figures, or devices, which are raised or in relief," using gutta percha as being best adapted. A piece of gutta percha is taken of the requisite size and form, and an impression is made upon it of the device, &c. intended to be printed or produced by means of the blocks or forms." Any roughness on the face of these impressions is removed so as to fit it "for receiving the ink, color, or other printing material to be applied to it for the purpose of printing."

AIR, FIRE, AND WATER PROOFING. 291

Second, preparing the surface of "the receiving or transferring plate" "either by giving it a smooth and even polish," in which case preference is given to the plate being copper, "or by covering it with gutta percha, or by covering it with the ordinary and well-known composition of glue and treacle, which is used for printers' composition rollers," and printing upon it "the desired figures or devices in the desired positions, and in one or more colors, as desired."

Third, a mode or modes of printing letters, figures, or devices upon papers, cloths, calicoes, or other articles by means of arrangements of rollers which work as follows. "The device cylinders become severally inked by their respective inking rollers," and print their devices on to the transferring cylinder, which transfers it on to the surface to be printed, the surface "being pressed against the transferring cylinder" "by means of a roller or drum."

One of the device cylinders is "supposed to have a gutta percha surface;" other device cylinders are represented as having their raised surfaces of gutta percha, or what is much better, of wood or metallic surfaces, or such devices may be produced by electro-galvanic deposit." Another is composed of a series of metallic discs. The surface of the transferring cylinder should be composed of gutta percha, &c.

[Printed, 11½d.]

A.D. 1853, March 26.—N° 725.

MORGAN, JOSEPH.—"Improvements in engines or apparatus for raising and forcing liquids and fluids."—*This invention did not proceed, the Law Officer having refused provisional protection.*—It consists in using "a receiver made of vulcanized caoutchouc, or other similar yielding material, in which a vacuum is formed by pressure alternately applied and withdrawn."

[Printed, 2½d.]

A.D. 1853, March 26.—N° 729.

DE BERGUE, CHARLES.—"Improvements in railway carriages."—*This invention did not proceed, the Law Officer having refused provisional protection.*—These are, first, "A mode or modes of constructing the under frame or under carriage with an additional framing or apparatus for carrying the side or bearing springs."

292 INDIA RUBBER AND GUTTA PERCHA :

" and so holding the axle boxes and axles as, whilst allowing them to have the necessary play or movement, to diminish the vibrations and the shocks to which carriages, as ordinarily constructed, are more or less liable." Second, "A mode or modes of constructing vulcanized india-rubber side or bearing springs for railway carriages, so that grease or other lubricating material may be applied to the metal parts without running into contact with the india-rubber."

[Printed, 2½d.]

A.D. 1853, March 29.—No 749.

RIDER, ISAAC.—"Improvements in cocks for drawing off beer or other liquids;" these are, applying the varying leverage of an eccentric for the purpose of shutting and opening a plug tap by pressure. Round the plug a ring of galvanized india rubber is annexed, for the purpose of rendering the contact more perfect when the pressure takes place. The action by turning the key half round will be to cause a vertical lever to bring the eccentric as far out as the axis of the tap as the leverage will allow, removing the pressure from the shoulder, and opening the cock a half turn in the contrary direction, will cause an equal length of play in the opposite direction, the pressure will again take place, and the tap be hermetically closed.

[Printed, 4½d.]

A.D. 1853, March 29.—No 755.

PYM, JOHN.—"Improvements in the permanent way of railways;" these are, constructing sleepers (which are transverse) of "earthenware, slate, stone, or other suitable materials;" and of whatever material they may be made "forming them hollow, instead of solid as heretofore;" and in order to prevent what is termed sopping, "perforate the bottom or sides to allow the water to enter the interior chamber thereof, and to run off at either end." To fix the chairs upon the sleepers where not desirable or practicable to adopt the methods now in use, "form the sole of the chair sufficiently long to overlap the sides or edges of the sleeper, and secure the ends of the sole by passing a bolt from side to side, through the sleeper, and fastening the same by a nut, pin, or rivet;" to prevent the jarring of the chair and

sleeper "place wood, felt, or other suitable material between the  
" the chair and the sleeper."

[Printed, 2½d.]

A.D. 1853, March 29.—N° 757.

BERNARD, JULIAN.—" Certain improvements in boots, shoes,  
" and clogs, and in the machinery or apparatus and materials  
" connected therewith;" these improvements are said to be  
" eleven in number, and one is said to be in " arrangements and  
" combinations for pressing the outer soles or heels of boots and  
" shoes upon the uppers and inner soles, when such parts are  
" attached or united by means of a suitable adhesive substance;"  
" this is performed " by placing the last on the table of any con-  
" venient press, while the upper part or top of the press is  
" furnished with a moveable piston, to which is attached a die  
" or pressing surface, and a piece of vulcanized india rubber or  
" other suitable elastic material so as to press uniformly all over  
" the sole of the boot or shoe." Another consists " of the appli-  
" cation and use of heels of wood, made of a required form for  
" boots and shoes, impregnated or charged with caoutchouc,  
" gutta percha, asphalte, or other suitable waterproofing material,  
" and which may be performed in a suitable vessel under any  
" convenient pressure," and in clogs " charging or impregnating  
" the heels and other " parts made of wood with caoutchouc,  
" gutta percha, bitumen, asphalte, or other suitable waterproofing  
" material, whether the same may be used alone or in combination  
" with other materials."

[Printed, 1s. 0½d.]

A.D. 1853, March 30.—N° 763.

NICKELS, CHRISTOPHER.—" Improvements in weaving narrow  
" fabrics;" these are, first, " employing two carriages with shuttles,  
" or (with bobbins therein) working in combs and acting as  
" shuttles in each fabric, in combination with three warps—a  
" middle stationary warp composed wholly or partly of india  
" rubber, or of non-elastic threads, and a warp on either side of  
" such middle warp, which outer warps are moved by guides,  
" bars, or harness through and through the stationary or middle  
" warp, the two carriages or shuttles being caused simultaneously  
" to pass on opposite sides of the middle warp; and, if desired,

294 INDIA RUBBER AND GUTTA PERCHA:

“ they may, in their successive movements, be caused to change sides with each other, and thus wind their weft threads round the middle warp.” Second, “using an india rubber or partly india rubber warp, with a weft guide on either side (front and back), and several carriages moved through and through the middle warp, the front and back weft guides throwing in their weft between the elastic or non-elastic warp and carriage threads alternately, as the carriages come into the front and back combs.”

[Printed, 3s. 4½d.]

A.D. 1853, March 30.—N° 766.

VILLIET, JOSEPH XAVIER.—“Certain improvements in the production of created (aerated?) liquids.—*This invention is void by reason of notice to proceed not having been given within the time prescribed by the Act.*—It consists, first, in the placing for the production of gaseous liquids prepared with carbonic acid, the tartaric, chloridric, sulphurous acids, the chloreate bicarbonate of soda, by sulphate acid of alumina, which cover with sulphate of lime or silicate of magnesia as a protecting powder.” Second, “uniting the lower and upper vessels forming the apparatus by means of a middle piece having screws and a cock. That ring is rendered air tight by means of a vulcanized caoutchouc washer, provided, as well as the ring with a hole, through which passes a brush made of hair to permit of the gas disengaged in the lower recipient to pass into the upper vessel, and hereby replacing the metallic tube and cork now generally used.”

[Printed, 4½d.]

A.D. 1853, March 30.—N° 767.

HOUSTON, JAMES.—“Improvements in weaving.”—*This invention is void by reason of notice to proceed not having been given within the time prescribed by the Act.*—It consists in “arranging the harness and weaving details of figuring looms that they may work without the use of the ordinary leaden or other metal weights, commonly adopted for keeping a uniform, even strain upon the cords or harness,” by “connecting the lines of the harness to any convenient bracket or fixed detail of the framing, through the intervention of separate strips or cords of india

“ rubber or other similar elastic material, so that the required  
“ uniform strain is kept up throughout the harness, and a free  
“ elastic movement is secured without the use of any loose pen-  
“ dant weights.” “ The arrangement may be modified in various  
“ ways so long as this system of elastic connexion is retained, the  
“ object being to secure economy in the fittings and a superior  
“ action in weaving.”

[Printed, 24d.]

A.D. 1853, March 31.—N<sup>o</sup> 773.

HANSON, GEORGE, and CHADWICK, DAVID.—“ Improve-  
“ ments in apparatus for measuring gas, water, and other fluids,  
“ which improvements are also applicable for obtaining motive  
“ power;” these are “ in the use of a flexible tube or bag, into  
“ one end of which gas, water, or other fluid to be measured enters  
“ from the main or other source, and there exerting its force  
“ against a roller or rollers placed upon the tube or bag causes  
“ the said roller or rollers to revolve and discharge from the other  
“ end thereof the fluid which had previously entered. Each re-  
“ volution, therefore, will represent a certain amount of fluid  
“ which has passed the apparatus through, and it may be regis-  
“ tered by means of any ordinary count connected to the roller  
“ or rollers. If used for obtaining motive power, motion may be  
“ communicated in any ordinary manner.”

[Printed, 54d.]

A.D. 1853, April 1.—N<sup>o</sup> 782.

PETERSON, ROBERT EVANS.—“ An improved piston ” (*a com-  
munication*).—This consists in “ forming a piston for steam, hy-  
“ draulic, pneumatic, or other engines of a flexible or elastic  
“ material, of a hollow, hemispherical, or conical shape, provided  
“ with a rim or flange around its outward edge, which flange is  
“ held fast by screw bolts between the flanges of two hollow  
“ metal hemispherical-shaped vessels, which form the cylinder;  
“ and within the upper cylinder the flexible piston is enclosed,  
“ so as to form a steam-tight chamber between its upper surface  
“ and the inner surface of the metal hemisphere. The flexible  
“ hemispherical or other shaped piston must be constructed of  
“ any suitable non-conducting substance, as vulcanized india  
“ rubber, or canvas united to vulcanized india rubber, and after-



296 INDIA RUBBER AND GUTTA PERCHA :

“ wards being inclosed within the hollow metal cylindrical vessel,  
 “ as before described; the piston rod passes and works through a  
 “ stuffing box attached to the top of the upper metal hemisphere,  
 “ and is also passed through the upper part of the flexible hemi-  
 “ spherical piston, to which it is securely fastened by means of  
 “ two wooden washers, which are made to press and bind against  
 “ the upper and under surface of the top of the flexible piston,  
 “ by the screw and nut at the bottom of the piston rod acting  
 “ against them.”

[Printed, 4½d.]

A.D. 1853, April 2.—Nº 786.

ANDERSON, Sir JAMES CALEB, Baronet.—“ Improvements  
 “ in locomotive engines.” In these improvements one is said to  
 “ be in a “ strap to convey the power of the engines to the wheels  
 “ of the steam carriage.” “ This is made of gutta percha formed  
 “ into wedge-shaped pieces united together,” “ but leaving a  
 “ space between each piece.” On the back of the strap is a  
 chain or wire rope “ to prevent the strap from stretching.”

[Printed, 1s. 6½d.]

A.D. 1853, April 2.—Nº 789.

BARTHELEMY, NICOLAS FERDINAND.—“ Improvements in  
 “ apparatus for sharpening razors.”—*This invention is void by  
 reason of notice to proceed not having been given within the  
 time prescribed by the Act.*—It consists of “ a thin elastic blade  
 “ or strip of steel,” “ rendered sufficiently firm or resistant while  
 “ still retaining a certain degree of flexibility by stretching it  
 “ between two supports or by fixing it to a piece of wood or other  
 “ rigid substance, with a strip of vulcanized caoutchouc between  
 “ the two, to form a sort of cushion. On the other side of the  
 “ piece of wood or other rigid substance is fixed a strip of vul-  
 “ canized caoutchouc. The razor is sharpened by laying it flat  
 “ upon the elastic steel blade, and moving it backwards and  
 “ forwards upon it. It may then be finished by stropping it  
 “ upon the caoutchouc. The caoutchouc may also be used  
 “ for stropping razors which have been sharpened by other  
 “ means.” “ Another mode of applying the elastic steel blades is  
 “ to fix a pair of them together at one end and to introduce the  
 “ razor (edge first) between them at the other end. The blades

“are pressed together by a spring clip, so as to bring them close to the edge of the razor, which is sharpened by drawing it backwards and forwards between the blades.”

[Printed, 2½d.]

A.D. 1853, April 5.—N° 817.

PIDDING, WILLIAM.—“Improvements in the manufacture of woven, textile, or other fabrics, and in the machinery or apparatus connected therewith;” these are as follows:—“Silk or other material of close texture (including paper)” are saturated with gelatine or gum, and stretched upon a frame and punctured with “points of wire or needles arranged and fixed in an instrument in accordance with the design previously made on the fabric, or in equidistant places;” then insert “studs or other forms of material described in a former specification of Patent,” No. 598, 1853, “into the holes so punctured, which are made to retain their form by allowing the gelatinized or gummed fabric to dry before withdrawing the pointed wires or needles.” “If wood, paper, or millboard be used for the groundwork of such fabrics, they may be rendered waterproof by saturating them with drying oils, solution of india-rubber varnish, or other coatings of similar properties.” “When the fabrics are prepared with gelatin, the gelatin may be rendered insoluble by tannin.” Besides studs of wiry material “threads of every description and spun glass, gelatinized or gummed,” are inserted, “and allowed to dry, and then cut into studs by means of numerous knives placed in a frame fastened or pinned to a support at one end and worked by a handle at the other or nearer end; that end of the knife frame which is fastened is allowed to move on a pivot; the knives act simultaneously against numerous threads at a time placed parallel to each other; the knives also to be placed parallel and equidistant to such distance as the length of the studs may be required.”

[Printed, 2½d.]

A.D. 1853, April 5.—N° 821.

PIDDING, WILLIAM.—“Improvements in the preparation or treatment of twine or other threads, or cuttings of paper or other waste, for the production of useful and ornamental articles;”

## 298 INDIA RUBBER AND GUTTA PERCHA:

these are, preparing thread, twine, narrow cuttings of paper or "skins, by dipping them into a solution of gum, gelatin, or "other substances possessing similar properties, covering them "when so prepared with flock or other materials," and using such threads, twine, and other articles, "when so prepared, for the "production of ornamental articles." "For knitting, crochet, and "other similar works, 'threads' prepared by extending and "compressing, or extending only (say a thread of india rubber) "the same, and making thereon equidistant holes" placing in these holes threads prepared as follows;—Taking "threads, twine, "narrow cuttings of paper or skins," dipping them "into a solution of gum, gelatin, or other appropriate substance," and running them through chambers containing flock, floss, or other suitable material, as precipitates, ground and spun glass, or pigments. "It is preferred to use "materials not soluble in water, "and gelatin used in preparing these threads, may be rendered, "when desirable, insoluble, or similar to leather by tannin." These threads are "particularly applicable to the making of net, "gauze, or other open fabrics," and they may be electro-plated, or they may be put "into a solution of gold, silver, or other metal," and passed through a chamber containing hydrogen or other gas, thus producing "upon them "a brilliant appearance." "This "will also form a ground or medium for electro-plating."

[Printed, 2½d.]

A.D. 1853, April 6.—N° 829.

JOHNSON, WILLIAM (*a communication*).—"Improvements in "the manufacture of safety paper."—*This invention is void by reason of notice to proceed not having been given within the time prescribed by the Act.*—It consists in the employment of "the rough and irregular surface produced by the fracture of a "piece of cast iron, or other brittle material, for giving the "requisite water-mark to paper employed in the manufacture of "bank notes, cheques, coupons, &c. A bar of cast iron, or any "other brittle material, is broken transversely, and a piece of soft "metal, gutta percha, or other suitable material is inserted "between the broken surfaces, and receives a correct impression "of their irregularities. From this matrix is obtained the regular "design which is transferred to the wire cloth on which the "paper is made."

[Printed, 2½d.]

A.D. 1853, April 7.—N<sup>o</sup> 842.

NICKELS, CHRISTOPHER.—“Improvements in machinery for masticating, kneading, or grinding india rubber, gutta percha, and other matters;” these are “using two rollers in each machine, the rollers are formed with screws on their surfaces, in place of the teeth or projections heretofore employed, and the rollers work parallel with each other.” The rollers work within a trough, which may, when desired, “have a steam jacket, if the matters, or any of them, which are being acted on require a greater heat than is consequent on the process itself.” In kneading or treating gutta percha, it is desirable “to use a steam pipe to allow steam to flow into the trough for a short time after the machine has been standing for a time; but when the machine is continued in work, the heat resulting from the process is found sufficient for gutta percha and for india rubber, and for compounds or mixtures containing those matters.”

[Printed, 1s. 1½d.]

A.D. 1853, April 11.—N<sup>o</sup> 869.

NICOLL, DONALD.—“Improvements in garments and in sewing or uniting the seams of the same.”—*This invention is void by reason of the patentee having neglected to file a specification in pursuance of the conditions of the Letters Patent.*—It consists, first, “in inserting under the arms of such garments what is called in the trade a sye piece, which is a piece of cloth or other material of the form of an inverted cone, the base of which is the seam which attaches the arm to the coat, terminating in a point some three or four inches from the base.” In some coats this piece may be made of the same kind of cloth as the rest of the garment; but it is proposed “to make it of india rubber, or india-rubber webbing, or of other similar elastic material for heavy coats, such as riding, driving, and sporting coats. The effect of the insertion of this piece is, that a cross seam in the waist of a coat may be dispensed with.” Second “attaching trousers and waistcoats together without using shoulder braces.” Third, “consists in a peculiar mode or method of uniting the seams of garments.”

[Printed, 2½d.]

300 INDIA RUBBER AND GUTTA PERCHA:

A.D. 1853, April 12.—N° 876.

MONDOLLOT, AUGUSTE.—“Improvements in filling vessels  
“ with aerated waters, and the apparatus employed therein” (*a  
communication.—This invention is void by reason of notice to  
proceed not having been given within the time prescribed by the  
Act.*—It consists of “an improved valve to be used in filling  
“ aerated liquid holders, which consists of a short tube working  
“ loosely with a tubular collar, the internal tube has two or more  
“ lateral openings formed in it to allow the liquid to enter. A  
“ small washer of vulcanized india rubber, or other suitable  
“ material, is fitted to the inner extremity of the valve tube, and  
“ this washer is pressed upon the surface of the tubular collar by  
“ the pressure of the fluid within the vessel. This valve is fitted  
“ to the bottom of the vessel, and when it is to be filled the vessel  
“ is inverted, and the short tube drops down a short distance, and  
“ exposes the lateral openings which allow the liquid to enter.”

[Printed, 2½d.]

A.D. 1853, April 13.—N° 885.

ARCHER, ALEXANDER EDWARD DUDLEY KNOX.—“Improve-  
“ ments in apparatus for applying metallic capsules.”—*This  
invention is void by reason of notice to proceed not having been  
given within the time prescribed by the Act.*—It consists “in an  
“ improved method of applying and affixing to the necks, mouths,  
“ or upper parts of bottles or other vessels, flexible metallic  
“ coverings, like those of Betts’ patent capsules,” as follows,  
“ cast or mould a ring of gutta percha or other suitable material  
“ possessing a certain amount of elasticity, but at the same time  
“ of sufficient hardness to force the capsule into the indentations  
“ on the neck of the bottle or other vessel. The inside of the  
“ ring must be made to fit the outside of the neck or other part  
“ of the bottle or other vessel.” The ring is cut across and fixed  
to a stand, “the neck of the bottle, with a capsule placed upon it,  
“ is then forced into the ring,” which is drawn tight by a cord  
passing round it, acting as a lever “and the pressure forces the  
“ capsule into the indentations in the neck of the bottle, the  
“ surprise is then removed and the bottle withdrawn.”

[Printed, 6½d.]

A.D. 1853, April 14.—N° 905.

HAIGH, THOMAS.—“The cleansing of pans and other culinary utensils.”—*This invention did not proceed to the Great Seal.*—It consists as follows:—“Instead of the usual domestic articles made of cloth, bristles, or similar materials, as brushes, mops, or hand cloths for cleansing kitchen and other utensils,” “to make an instrument for the said purposes to consist of leather and wire, india rubber and wire, or gutta percha and wire, fastened to a handle of any convenient shape or construction, and made of wood of any suitable construction or material. The said wire may be made of any suitable metal, amalgamation of metals, or any metal plated or coated with other metals.”

[Printed, 2½d.]

A.D. 1853, April 14.—N° 906.

DUNCAN, JOHN WALLACE.—“Certain new combinations of gutta percha with other materials, and the method of applying such for use,” compounding gutta percha with Canada balsam, or the balsam of the pinus balsamea, or that from the pinus larix or styrax from the liquid amber styraciflua, or other analogous balsams, in such proportions, and with or without certain proportions of shellac or other resinous or bituminous substances, according to the nature of the article to be cemented, so that the compound will bear sufficient heat without decomposing or becoming greasy on the surface. “A cement is prepared as follows:”—“Forty pounds of gutta percha, three parts caoutchouc, three parts shellac, fourteen parts Canada balsam or Venice turpentine, thirty-five parts of balsam from the liquid amber styraciflua or styrax, four parts of gum mastic, and one part oxide of lead.” For cementing and joining leather, a cement is “compounded” of “sixty parts of gutta percha, ten parts of shellac, two parts of caoutchouc, twenty parts of Venice turpentine, and eight parts of styrax.” “A cement adapted for uniting wood or caulking ships is composed of” “about fifty-five parts of gutta percha, fifteen parts of shellac, twenty-five parts of Venice turpentine, and five parts of pitch.” “To unite rigid substances, such as metals, glass, stone, and earthenware, a cement is compounded of forty-five parts of gutta percha, twenty parts of shellac, five parts of gum mastic, half a part of oxide of lead, three parts of styrax, twenty-six and a half part of Venice turpentine, mixing

302 INDIA RUBBER AND GUTTA PERCHA :

“ metallic powders, such as cast-iron borings, with this cement improves it for fixing iron railways to stone work, and such like purposes.” “ To cement and unite small particles of material, such as leather shavings, silk waste, hair, and the like,” compound a cement of twenty parts of caseum, fifteen parts of gluten, five parts of coagulated (or livery) linseed oil, one part of the oxide of lead, twenty-five parts of Venice turpentine, and thirty-four parts of gutta percha. About eight per cent. of gum ammoniacum may be introduced with advantage in the cement, instead of a like portion of the gluten. The above proportions may be varied, but those given are found to be the best for the several purposes described.” Masticating and covering machines are described, &c. &c.

[Printed, 11½d.]

A.D. 1853, April 16.—Nº 928.

WILKS, HENRY.—“ Improvements in cocks.” These are, first, the system or mode of lubricating cocks of any kind by one or more internal passages formed within the body of the plug, such passages being in connection with a suitable reservoir of lubricating material.”

Second, lining the barrels of cocks with “ leather, gutta percha, wood, or also lead or other compressible metallic substance,” thereby “ saving the expense of grinding the plugs of cocks into the barrels.” “ The inside lining or coating may be fitted to the plug instead of in the interior of the barrel of the cock.”

[Printed, 5½d.]

A.D. 1853, April 19.—Nº 942.

CHATTERTON, JOHN.—“ Improvements in coating tubes.” These are, “ coating a tube composed of gutta percha, india rubber, or compounds containing such materials, with lead or soft metal, by drawing the metal on to tubes of the softer material.” “ The leaden or other soft metal tube is to be made in the ordinary manner, and internally somewhat larger than the tube of gutta percha, india rubber, or compounds containing such matter or matters, so that the lead or soft metal tube may be readily passed over the other material or materials; the lead or soft metal tube, with the tube of gutta percha, india rubber, or composition within it, is next to be drawn

“ through a die or passed between grooved rollers suitable for  
 “ reducing the diameter of the lead or soft metal tube to such a  
 “ diameter as closely to fit the exterior of the tube within it.”

[Printed, 2½d.]

A.D. 1853, April 19.—N° 944.

FULLER, JOHN.—“ Improvements in galvanic batteries.” These  
 are, arranging “ a galvanic battery composed of copper and zinc,  
 “ in such manner that when the battery is not in use, that is,  
 “ when the circuit is not coupled up, that the fluids employed  
 “ shall not act on the respective metals; and for this purpose the  
 “ salts of the metals employed are found to be the best for the  
 “ purpose; and sulphate of copper in contact with the copper,  
 “ and sulphate of zinc in contact with the zinc, is what is pre-  
 “ ferred. The peculiarity of the invention consisting of the  
 “ employment for copper of a salt of copper, and for the zinc a  
 “ salt not acting on the metal when no circuit is made up. And  
 “ another improvement consists in using plumbago or coke in a  
 “ powdered state, in a porous cell, as the positive element of the  
 “ battery.” The troughs are “ divided into separate cells, com-  
 “ posed of any suitable material, such as wood coated with marine  
 “ glue, or of gutta percha, or otherwise,” and each cell is divided  
 “ by a porous partition into two compartments, the one for the  
 “ copper and the other for the zinc. In place of a positive metal,  
 “ such as copper, plumbago may be substituted. The zinc or a  
 “ negative metal is connected with the powder of plumbago or of  
 “ coke by a strip of copper attached to it, dipping into the powder.  
 “ In preference dilute sulphuric acid is used in the cells.”

[Printed, 2½d.]

A.D. 1853, April 19.—N° 946.

DAY, THOMAS.—“ A certain improvement in the manufactory of  
 “ boots and shoes, whereby great ease is secured to the wearer.”  
 This consists in applying “ to that part of boots and shoes known  
 “ as the waist,” “ an elastic material, whether outside or inside.”  
 The elastic material may be made as follows:—“ Threads prepared  
 “ of caoutchouc or indian rubber of suitable size and thickness are  
 “ laid parallel and at equal distance between thin leather or other  
 “ suitable material; and, at the same time, as they are being



304 INDIA RUBBER AND GUTTA PERCHA:

“secured between the leather or other material, by stitching or otherwise, the threads are strained out; and when the operation is complete and they are liberated, they will cause the leather or covering material to contract and remain in fine gathers.”

[Printed, 4½d.]

A.D. 1853, April 21.—Nº 958.

DEALE, ANTHONY.—“‘Ocean floats,’ which are designed to ‘save lives and light treasures from shipwreck.’—*This invention is void by reason of notice to proceed not having been given within the time prescribed by the Act.*—These floats “are to be “of all sizes, and to be made of zinc, tin, iron, corrugated or “galvanized iron, gutta percha, india rubber, wood, or any other “substance at option.” “The hold of the float will be square, “be in the centre, and be completely embedded in buoyancy. “The hatchway cover will screw on and off, and be fastened with “a padlock. The head and stern will be broad and flat, so that “combinations of them can be spread out, both lengthways and “sideways, and thus ramify their buoyant power in every direc- “tion. The body will be divided into sections, and be perfectly “water-tight from each other. In order that they may not be “over-freighted, so as indiscreetly to sink them, the weight each “will safely carry will be legibly stamped upon them, so that “combinations of them calculated to buoy up any given weight “can be accurately arranged according to circumstances. They “will be painted a bright scarlet, and have a small scarlet flag, “in order that they may be discerned and identified at a dis- “tance.”

[Printed, 2½d.]

A.D. 1853, April 25.—Nº 995.

BERNARD, JULIAN.—“Improvements in casting metals, and in “moulding or forming other materials;” these are, “casting, “moulding, or shaping metals, and a variety of other substances “when in a plastic state, such as iron, copper, brass, gutta percha, “caoutchouc, and their compounds, porcelain, and earthenware “of all kinds,” “in a partial vacuum, obtained by extracting the “atmosphere from the moulds or shapes in which the metal or “other materials are to be cast or moulded.” “When plastic or

“soluble materials are to be shaped, they may, if found desirable, be pressed or forced into the exhausted mould by any convenient means.” The moulding boxes are made in two parts, and are jointed together by bolts; they are connected to “an air pump other exhauster,” by “any suitable flexible tubing.”

[Printed, 4½d.]

A.D. 1853, April 27.—N° 1014.

GALE, JOSEPH WALTER.—“Improvements in the permanent way of railways;” these consist “in the employment of certain materials consisting of clay, or compounds of clay with other substances of a harder nature, containing quartz or other silicious materials, for the purpose of manufacturing railway sleepers, by the use of which substance sleepers can, with great facility, be manufactured of various forms, and in one or more parts, the materials being of a nature to resist the action of natural decay or corrosion for a considerable period. The use of these substances will also involve the adoption of improved chairs, and method of fastening chairs or rails, part of which may be applicable to ordinary sleepers.” And beneath these chairs is fitted a slightly elastic bearing surface, “which may be composed of wood, soft metal, gutta percha, vulcanized india rubber, felt, or other suitable material, to deaden the shocks occasioned by the passage of trains along the line.”

[Printed, 5½d.]

A.D. 1853, April 27.—N° 1021.

CULPIN, THOMAS.—“Improvements in steam boilers, and in the appendages thereto;” these are, “the construction of the fire boxes of steam boilers in such a way as to render the consumption of fuel and gases more perfect, and at the same time afford a ready means for raking out the cinders from the ash-pit.” “The working the damper by means of the waste steam from the safety valve.” “The regulation of the feed of the water in steam boilers by means of a syphon pipe placed in connexion with the pump or other feed apparatus.” “The water and steam guage,” and “the apparatus for indicating the pressure of the steam in the boiler.” The “water and steam guage” may be described as follows:—A cock, “the interior of

“ which is divided into two chambers.” “The upper  
 “ is in communication with the water in the boiler,  
 “ lower one opens into a pipe,” “ which is continued  
 “ the steam space, so as always to be filled with steam  
 “ boiler is at work.” “The plug of the cock is made  
 “ and is in communication, when open, with both the  
 “ steam chambers; a pipe, the lower end of which is secured  
 “ the division and opens into the steam space,” “ is  
 “ upwards through the hollow plug to above the water  
 “ is closed with a cap,” “ which is pierced with a circle  
 “ concentric with the exterior of the tube,” “ and above  
 “ line in the boiler.” “These holes open into a glass tube  
 “ centric with the steam pipe,” “ which is held at top by  
 “ the lower end being let into the hollow part of the  
 “ opening into the water chamber of the cock.” “The  
 “ lower ends of the glass tube are kept steam tight  
 “ rubber rings.” “By the arrangements above described  
 “ the cock is opened, water and steam are admitted into  
 “ tube, whereby the height of the water in the boiler is  
 “ &c.” In an apparatus for indicating the pressure of steam  
 in the boiler is described a pipe in communication with the  
 the boiler, which has a cap perforated with a circle of holes  
 is cast upon the lower part of the cap, while a second  
 screwed upon the upper part of the cap. A spiral spring  
 between these flanges, and surrounding the cap, “but  
 “ sufficient steam space for the steam to enter from the  
 Outside of this spiral ring is an india-rubber ring, and sur-  
 this again is another spiral spring, one end of which is  
 with a pointer, which is made to traverse round a graduated  
 by the steam entering from the holes pressing upon the surface  
 [Printed, 7½d.]

A.D. 1853, April 28.—N<sup>o</sup> 1031.

BERRY, JAMES, and BOOTH, THOMAS.—“Improve-  
 “ machinery or apparatus for printing or staining wove  
 “ and paper;” these are “the use of sieve rollers made of  
 “ substances or materials working in contact with the  
 “ rollers.” “In surface printing, instead of using inter-  
 “ and furnishing rollers with loose sieves to convey the  
 “ matter from the color box to the printing surface,” &c.

“ them so that the peripheries of the color or sieve roller are in  
 “ immediate contact with the printing surface to which the color  
 “ is thus conveyed; and instead of making the color or sieve  
 “ rollers of metal or hard material,” “ make them of flexible or  
 “ yielding material, as india rubber, gutta percha, or a composition  
 “ of any materials that will form a yielding substance, such as is  
 “ ordinarily used by letter-press printers for conveying the ink to  
 “ the type.”

[Printed, 6½d.]

A.D. 1853, April 28.—N° 1032.

FAIRBAIRN, PETER, and KASELOWSKY, FERDINAND.—

“ Improvements in machinery for drawing, roving, and spinning  
 “ flax, hemp, and other fibrous substances ;” these are, carrying  
 “ the sliver round a greater or less part of the circumference of  
 “ one or more rollers, for the purpose of bringing the fibres in  
 “ contact with so much of the surface of them as will cause an  
 “ amount of adhesion and friction sufficient to retain all short  
 “ fibres which are not yet taken hold of by the drawing rollers,  
 “ and to prevent them from moving forward at a greater speed than  
 “ that at which the surface of the retaining rollers is moving. In  
 “ order to increase the amount of adhesion, as well as that of  
 “ friction, the sliver may be wetted before passing over the surface  
 “ of the retaining rollers ; and an endless carrying belt, made of  
 “ leather, gutta percha, or other suitable material, may be used for  
 “ the same purpose.”

[Printed, 4½d.]

A.D. 1853, April 29.—N° 1037.

DAY, GEORGE THOMAS, and DAY, ELIZABETH.—“ Improve-  
 “ ments in travelling packages ;” these are “ constructed by  
 “ first forming a light metal skeleton box or framing, of the  
 “ desired shape of the bag ; such box or framework may be made  
 “ to open at the middle,” “ with hinges at one side, so that the  
 “ lid may have nearly the same capacity as the bottom portion, or  
 “ it may be made to open at the middle,” “ with hinges at one  
 “ side, so that the lid may have nearly the same capacity as the  
 “ bottom portion, or it may be divided longitudinally, that is,  
 “ from top to bottom,” “ then hinged on the other side.”

308 INDIA RUBBER AND GUTTA PERCHA :

" Whatever form is chosen, the exterior may be afterwards covered." " The interior boxes may be made of any suitable thin sheet metal, turned broad and even at the edges forming the mouth or opening, or having a proper hinged rim of stronger metal, exactly closing all round." " One or both of these joining surfaces should then be covered or inlaid with vulcanized india-rubber, so that when pressed down and locked a close joint will be formed thereby."

[Printed, 8½d.]

A.D. 1853, April 30.—N° 1051.

BARRETT, BARNAUDAS.—" Improvements in the treatment of natural and artificial stone, and of articles composed of porous cements or plaster, for the purpose of hardening and coloring the same ;" these are, enclosing " the stone or other materials to be operated upon in an air-tight chamber, and exhaust or partially exhaust the same, and then allow the indurating substance, whether hot or cold, to trickle down or flow into the chamber to fill the vacuum, the effect of which will be that the liquid indurating substance will readily find its way into the pores of the stone or other material, and become incorporated therewith." " Before subjecting the materials to this process of injection they must be heated in a chamber or oven to from fifty to sixty degrees, for the purpose of driving out whatever moisture they may contain ;" and " the articles should be worked or fashioned to their required form before being thus operated upon." " When the materials or works of art require to be colored, stain them with any suitable vegetable or mineral color by laying the same on with a brush, and allow the color to dry before commencing the indurating process."

Mixture No. 1. The composition of this solution is as follows :—Sulphur dissolved, by the aid of steam heat or dry heat, in dilute vinegar or ascetic acid. In preparing indurating mixtures, to be applied to the exteriors and interiors of buildings, whether possessing a surface of brick, stone, cement, or plaster, employ the following ingredients :—

Mixture No. 2 contains shellac, seed lac, coarse turpentine, pyroligneous spirits.

Mixture No. 3 is composed of gutta percha dissolved in coal tar, naphtha, or other suitable solvent.

Mixture No. 4. The ingredients of this mixture are as follows :  
—To limestone or chalk add water and beer grounds and gall, and mix the same well together. If it is desired to color the mixture, this may be done by adding thereto pitch, or vegetable or mineral colours.

“ These solutions, when made lukewarm, may be laid on with a brush until the surface treated will absorb no more. Works of art, blocks of stone, and other detached porous materials of the kind specified, may also with advantage be indurated by the use of these mixtures.”

[Printed, 3½d.]

A.D. 1853, May 4.—Nº 1095.

GOODYEAR, CHARLES.—“ Improvements in combining india rubber with certain metals;” these are, in the manufacture of articles combining with “ the hard compound made of india rubber and sulphur (with or without other matters), subjected to heat ” “ thin surfaces of gold, silver, or other metal, exterior or interior of the article of the hard compound.” “ Supposing it to be desired to ornament or coat, or partly to coat, a cup or vessel with an exterior coating of open gold work,” “ take thin sheet metal, and cut therefrom the device required, and then, by stamping or otherwise, make it of such form as to fit the mould in which the cup or vessel, the compound of india rubber, is to be formed, and having introduced the metal, whether composed of one or more pieces, the plastic compound of india rubber is to be introduced and pressed into form in the mould, by which the metal will become imbedded or partially imbedded in the plastic compound.”

[Printed, 3½d.]

A.D. 1853, May 5.—Nº 1106.

BOWRA, MATTHIAS EDWARD.—“ Improvements in saddlery and harness;” these are, “ using india rubber or caoutchouc, either vulcanized or otherwise, prepared or not prepared, in combination with canvass or other woven or textile material or leather, for the purpose of making saddlery and harness.” “ Cut strips or pieces of the form required, of caoutchouc, and between two or more such strips or forms place the canvass, leather, or other above-mentioned fabric;” or “ use, when

310 INDIA RUBBER AND GUTTA PERCHA:

"desirable, the single strip or form of caoutchouc, with one or other of the materials named." "Then sew, press, or otherwise compel the materials used to adhere to each other, and use the articles, when completed, for traces, straps, bands, seats, or other portions of saddlery and harness."

[Printed, 2½d.]

A.D. 1853, May 6.—N° 1112.

BELL, CHARLES WILLIAM. — "Improvements in carriage springs."—*This invention is void by reason of notice to proceed not having been given within the time prescribed by the Act.*—It consists in providing, "both for the horizontal and vertical motion" of the body of a carriage, by using "rigid levers bearing upon elastic fulcra, or rigid levers combined with elastic springs, in such a manner that by their conjoint action they shall yield to and control the motions communicated from the bed and axles to the body of the carriage, in a similar manner to the motion of the parallel ruler." "The springs may be of various forms and materials," "but preference is given to those which are the stiffest and quickest in their reaction, and least subject to large compression, as vulcanized india-rubber, the stiff spiral spring used in railway buffers or the oval steel spring; although, by a modification of their application, even the lightest springs may be rendered applicable."

[Printed, 2½d.]

A.D. 1853, May 6.—N° 1119.

JACOB, GEORGE WILLIAM.—"An improved manufacture of metallic covers or seals for bottles, jars, and other like vessels, and in applying or affixing them." The mode of casting, &c. these covers or seals is described, and it is stated that they "can be pressed tight to the neck of the bottle by using a machine which consists of three or five antifriction rolls, covered with vulcanized india rubber or other suitable flexible material." "These rolls are fixed in a suitable frame at proper distances to admit of the neck of the bottle, with the cover on it, being placed between them as a working spindle might be. By pressing a lever the top roll or rolls descend, and press upon the cover or seal; the bottle is then partly turned round, and the

“ cover or seal is thus closely pressed against the neck of the  
 “ bottle.” “ There is a disc at the back of the frame, against  
 “ which the mouth of the bottle presses, causing it to revolve  
 “ with the rest.” “ Another mode of applying such covers and  
 “ seals to the necks of bottles consists of inserting the necks of  
 “ the bottles, with such seals and covers on, into a hole made in  
 “ the centre of a piece of wood, and before which hole a piece of  
 “ india rubber or other elastic material is placed tightly on a  
 “ wooden or other frame.”

[Printed, 6½d.]

A.D. 1853, May 6.—N° 1121.

NICKELS, CHRISTOPHER. — “ Improvements in machinery  
 “ for masticating, kneading, or grinding india rubber or other  
 “ matters ;” these consists “ of causing cylindrical or conical  
 “ rollers, having projections, teeth, indents, or grooves, to be  
 “ arranged to work ” so that these projections, &c. “ do not enter  
 “ into each other ;” and the forms of the projections, &c. “ may  
 “ for this purpose be varied, and the rollers may work at a like  
 “ or different speed.” In carrying out this, two rollers, cut with  
 angular grooves or projecting parallel ribs, are shown, placed in  
 a trough or box ; and it is stated that it has been found desirable  
 “ to use a steam pipe to allow steam to flow into the trough for  
 “ a short time after the machine has been standing for a time ;  
 “ but when the machine is continued in work the heat resulting  
 “ from the process is found sufficient for gutta percha and for  
 “ india rubber, and for compounds or mixtures containing those  
 “ matters.”

[Printed, 1s. 1½d.]

A.D. 1853, May 7.—N° 1126.

PALMER, CHRISTOPHER RICHARD NORRIS.—“ A new, and  
 “ improved mode of communicating or signalling between the  
 “ guards and engine drivers on a railway train ; also applicable  
 “ to other purposes.” Placing a metallic cylinder or vessel  
 (called a signalizer), “ containing a piston and rod working per-  
 “ pendicularly, and air-tight, with or without a lever or handle  
 “ attached. Elastic vessels might be used also. The size of this  
 “ cylinder is regulated by convenience or the power required.”



## 312 INDIA RUBBER AND GUTTA PERCHA:

"At the lower part of the signalizer cylinder, below the piston," "insert an air and liquid tight tube or conductor chain, of a "quarter inch diameter." "This chain is made of metal, gutta percha, india rubber, or partly of each." "If required to be "in one length, and to reel and unreel in the guard's box," "use "a small india-rubber tube, protected inside or out." In general, the conductor "should be in separate lengths, to link "and unlink instantly between each carriage; the metal and "gutta-percha tube will be permanently fixed under or along the "bodies of the carriages." "Between them the conductor is of "stout vulcanized india-rubber tubing, of similar inner diameter, "and coated with an elastic steel or wire spring." "This hangs "in a slight curve, and links and unlinks in one second, near the "coupling irons, either by a common single gas union joint, which "is quite sufficient for signaling purposes, or by the double "steam-tight joint afterwards described." "On the engine or "tender, or close to the engine driver or in the leading guard's "box," "place or swing from the roof, or otherwise, another but "smaller cylinder, called the signalia cylinder, with piston and "rod working perpendicularly therein." "Then connect the "guard's signalizer with the driver's signalia cylinder by insert- ing the opposite end of the conductor into the lower part "beneath the piston; sometimes an elastic or air and liquid tight "bag is inserted under the piston foot." "A bell or alarum (so "constructed that they will signal, and the hammer or trigger "re-set, immediately after being forcibly struck, directly or "indirectly, by the upward motion of the rising piston rod), are "placed in a box above or near the cylinder," &c. The "double "steam-tight joint;" "inside this joint, at both ends, place india- rubber or elastic washers, so that the two inner ends of the joint " (or tubes) meet, when the joint is closed with india-rubber pres- sure," &c. These joints are made of any size required, "either "of gun metal or brass, or cast in and made of gutta percha." "This principle and apparatus is also applicable for signaling to and fro' railway stations, tunnels, junctions, curves, and all "points of danger," "enabling every train to notify its locality, "and approach towards these danger points;" "laying down "along the rail a metallic or gutta-percha tube of similar dia- meter, with an elastic and air and liquid tight bag at each end, "in small cylinders or not;" filling the "conductor and bags "with any mixture of non freezeable or coagulable liquids, not

“ water alone, or with air, gas, or elastic fluids, condensed to any  
“ density required, separate or in combination. At the station or  
“ signal point the bag is placed in a little cylinder, with piston  
“ and rod attached to or acting upon powerful signalia of any  
“ description,” &c.

[Printed, 4½d.]

A.D. 1853, May 14.—N° 1203.

BRADY, JOHN DRUMGOOLE.—“ Improvements in knapsacks;”  
“ these are, constructing knapsacks, whereby they are rendered  
“ lighter, are made to fit the back more easily than heretofore, and  
“ are slung or suspended in such manner that they may be carried  
“ with increased comfort, without in any way impeding or inter-  
“ fering with the free movements of the wearer, and whereby they  
“ are also made perfectly waterproof.” The body or frame “ is com-  
“ posed of gutta percha or compounds thereof, or of papier mâché,  
“ or straw board, moulded into the precise shape required, or it  
“ may be made of wood or of a combination of wood and straw  
“ board or papier mâché; and when thus made of other materials  
“ than gutta percha or compounds thereof, it is covered with  
“ undressed skin or leather, or vulcanized india-rubber cloth, or  
“ American cloth, or painted canvass, or other suitable waterproof  
“ material, so as to make a knapsack both light and water-  
“ proof,” &c.

[Printed, 5½d.]

A.D. 1853, May 16.—N° 1211.

PHILLIPS, MORETON HASSALL.—“ An improved gun;” in  
which is employed, “ as the propulsive force for projecting the  
“ missile from the barrel, the elastic retractile power of a tube or  
“ strip of vulcanized india rubber or other suitable elastic mate-  
“ rial.” “ This tube or strip is secured at one end to a button  
“ in the muzzle of a second or independent barrel, and is drawn  
“ back or stretched by a rod passing through a catch attached to  
“ the other or rear end of the tube, or it is forced back by a  
“ ramrod introduced at the muzzle of the barrel. The catch is  
“ connected to a slide in the discharging barrel, and when drawn  
“ or forced back to the breech of the gun, is retained in its posi-  
“ tion there by means of a second catch in connexion with the

314 INDIA RUBBER AND GUTTA PERCHA:

" trigger, the pulling of which disengages the two catches and  
 " the slide, and thus allows the elastic retractile force of the  
 " extended india-rubber tube or strip to project the ball or other  
 " missile which has been previously placed in front of the slide  
 " of the discharging barrel."

[Printed, 7½d.]

A.D. 1853, May 18.—Nº 1221.

PALMER, CHRISTOPHER RICHARD NORRIS.—"An improved  
 " mode and apparatus for working the machinery in factories and  
 " ships in connexion with the steam engines or steam power now  
 " used therein."—*This invention is void by reason of notice to  
 proceed not having been given within the time prescribed by the Act.*  
 —It is described as follows: "Take an ordinary steam engine to  
 " obtain motive power," "then attach to or connect with it a  
 " metal cylinder containing water, oil, or other liquid. In this  
 " cylinder is a piston and rod or metallic plungers capable of  
 " working perpendicularly." At any required distance "erect  
 " another, called the factory cylinder, with piston and rod some-  
 " what similar, and working perpendicularly; the cylinder also  
 " containing same liquid." "Then connect the near cylinder  
 " with the factory cylinder by an air-tight and waterproof tube  
 " or pipe of gutta percha, &c." one "end being inserted in the  
 " lower part of each cylinder below the piston." Then attach a  
 " machine or machines (somewhat similar to the force pumps used  
 " with Bramah's press) to the steam engine; the latter, acting  
 " upon the lever of the pump or pumps, plunges one or more  
 " metallic piston rods or plungers into the near cylinder and  
 " displaces a quantity of liquid exactly equal to the quantity"  
 required "to displace or raise in the factory cylinder." "The in-  
 " stant the steam engine thus forces down" the "rod or plungers,  
 " the piston and rod in the factory cylinder rises with equal power,  
 " and the down stroke of one is completed at the same instant as  
 " the up stroke of the other. The up stroke of the plunger, and  
 " the fall or down stroke of the factory piston rod, are also  
 " simultaneous."

[Printed, 2½d.]

A.D. 1853, May 19.—Nº 1238.

GRAHAME, THOMAS.—"Improvements in the manufacture of  
 " covering materials for houses and other structures and sur-

"faces;" these are, "coating and filling up the interstices of wire cloth with india rubber and gutta percha," "thus protecting the wire cloth from corrosion, and rendering it impervious to air or gases, and to water and any liquid." "If sheet india rubber or gutta percha be used, the same should be very thin, and a sheet should be placed on either side of the wire cloth, the surfaces which come together being first coated with india-rubber or gutta-percha cement; and such sheets, with the wire cloth between them, are then to be submitted to pressure, which is best done by passing them through between pressing rollers;" or, in place of using sheets, "a solution of india rubber or of gutta percha may be applied to the wire cloth by means of a brush, allowing time for evaporation of the solvent used, before applying succeeding coats of the dissolved matter."

[Printed, 2½d.]

A.D. 1853, May 19.—N° 1241.

GILBERT, JOHN AMES.—"An improvement in canisters."—*This invention is void by reason of notice to proceed not having been given within the time prescribed by the Act.*—It consists in preventing these articles from scratching and otherwise injuring the counters by forming "a flange or ring to the ordinary metal bottom," and filling it in "with cork, gutta percha, or other suitable material, which will not be likely to scratch a polished surface on being placed upon or drawn along it. From the yielding nature of the additional bottom, the canister will not become bulged or indented at bottom, and will consequently be found to last longer."

[Printed, 2½d.]

A.D. 1853, May 21.—N° 1260.

SCOUTETTEN, HENRI JOSEPH.—"An improved plastic compound applicable to various ornamental and useful purposes," "composed of vegetable and mineral substances;" "the number and quantity of each varies according to the purpose for which the material is required." The substances may be "gutta percha, caoutchouc, pitch, resin, wax, gum lac, oxyde of iron, golden sulphur of antimony, ultra marine, chrome, zinc white, &c." *Hollow cylinders heated by steam crush the substances*

## 316 INDIA RUBBER AND GUTTA PERCHA:

into a mass. The paste resulting is compressed in moulds "composed of gutta percha, containing a twentieth part of caoutchouc." "Each mould should be bound with iron." "This paste may also be composed chemically. In this case the gutta percha, caoutchouc, and pitch are dissolved in sulphuret of carbon. When the solution is complete, and the combination well effected, the solution is purified, the sulphuret of carbon is drawn off, and a mass is obtained which may be heated dry in close vessels." "If it be desired to make pipes, boot soles, straps, &c., add to the above substances, held in solution in the sulphuret of carbon, carded cotton," "a mass is obtained which is heated dry, and passed under rollers." "Under other circumstances, and according to known processes, the cotton is replaced by linen, canvas, silk, wool, or any other textile substance. The paste thus prepared may be colored by adding one or more of the oxydes indicated." "To render paper or stuffs impermeable, the caoutchouc and the gutta percha must be separately dissolved in sulphuret of carbon, in the proportion of eight of gutta percha for one hundred of sulphuret of carbon well purified. The solution is left to rest during eight days, and the white of eggs is added to it. When the impure matters are deposited, it is poured forth to obtain an almost colorless liquid. Paper or stuff may be then steeped in this liquid, and drawn from it by passing them between cleansing rollers which equalize the layer of the matter. These stuffs become fit for all impermeable clothing; the paper rendered impermeable is suitable for photography. It is a substitute for parchment; it serves for the preservation of valuable papers, to prevent their falsification, erasures, and the action of chemical agents." "As to the applications of the paste, they are innumerable."

[Printed, 2½d.]

A.D. 1853, May 23.—N° 1263.

CARPENTER, SAMUEL ALFRED.—"A new or improved elastic webbing or fabric." This is made "by introducing into the fabric" "a mixture, in any proportion or in any way, of threads of vulcanized and unvulcanized caoutchouc," ordinarily using "alternate threads of vulcanized and unvulcanized caoutchouc," *but varying the proportion as "greater or less elasticity" is required, and modifying "the elasticity by altering the weights*

“ used upon the warps of caoutchouc or cotton in the process of weaving.”

[Printed, 2½d.]

A.D. 1853, May 23.—N° 1269.

**BROWNE, JOHN HARCOURT.**—“ Improvements in apparatus for bottling or supplying vessels with fluids;” these consist of a funnel-formed receiver, with a tube descending into the bottle or vessel; the exterior of such tube where it enters the neck of a bottle or opening into a vessel, is partly covered with vulcanized india rubber, or it might be other elastic material. Down the interior of this tube descends a hollow rod or tube with a valve at its end, by which the passage of fluid from the funnel can be stopped at pleasure by raising the valve. The lower part of the tube which enters the neck or opening into a bottle or vessel fills or occupies part thereof. When the liquid has been allowed to flow till a bottle or vessel is nearly full, the air which cannot get away except through the valve tube is, on the liquid rising above the end of the tube, stopped, and the filling is stopped also, and the apparatus may be removed without loss of liquid by raising the valve.”

[Printed, 5½d.]

A.D. 1853, May 25.—N° 1275.

**BABB, WILLIAM.**—“ Improvements in the manufacture of hair trimmings;” these are, manufacturing trimmings “varying from one quarter of an inch to nine inches or thereabouts in breadth, with a plain close surface, the weft being of hair, or combined with suitable materials, and the warp formed of wire, glass, india rubber, or threads of silk, cotton, hemp, flax, wool, and like materials, which, when desired, may be rendered waterproof by any of the usual processes, and each may be used singly or any two or more in the warp; generally the warp should be of a waterproof material as well as the weft.”

[Printed, 2½d.]

A.D. 1853, May 25.—N° 1279.

**RUSSELL, FREDERICK.**—“ Improvements in raising and lowering windows, shutters, blinds, and similar appendages,” consisting

of a peculiar arrangement "of pulleys, levers, rollers and cords," described as follows:—"Inside the carriage door two tassels are visible only; one for pulling the window up, the other for pulling it down. The 'up' tassel is attached to a silk or other cord running first over a pulley fixed to the door a little below the bottom of the window, when closed, down to another pulley at the bottom of the door, thence over a roller fastened to the door in the same horizontal plane as the pulley first-mentioned, fastening at last to the bottom of a metal plate firmly fixed to the bottom of the window, so that by pulling the 'up' tassel the window is raised to any required position. The down tassel is likewise attached to a silk or other cord running over a pulley fixed a little below the window, when closed down, round another pulley at the bottom of the door, thence to a peculiarly contrived lever fastened to the bottom of the window, for the purpose of raising it over the fence plate, and afterwards for pulling it down to the bottom of the door. Hence, by pulling the "down" tassel the window is lowered." "To prevent the window from falling by its own weight, a piece of india rubber or similar material is fastened to the bottom of the door, which then passes over the roller before named, and is then secured to the metal plate at the bottom of the window. Round this roller a piece of catgut is twisted, afterwards passing over a pulley at the door, forming an endless cord; to this the brass plate at the bottom of the window is attached, in order that the friction of the gut of the roller may overcome the gravity of the window, causing a complete equilibrium which allows the window to pass up or down with the greatest ease."

[Printed, 5½d.]

A.D. 1853, May 26.—N<sup>o</sup> 1295.

NORMANDY, ALPHONSE RENE LE MIRE DE.—"Improvements in regulating the pressure of steam." This invention consists "of employing a valve apparatus between a steam boiler and a vessel or vessels or chambers in which the steam is to be used at a lower pressure than that at which it is generated." "The valve in each apparatus is connected to a flexible surface of vulcanized india rubber, &c., of such dimensions compared with the size of the valve (which closes the passage between the boiler and the apparatus where the steam is to be used) as will,

“ by the lesser pressure of the steam thereon, close the valve, and prevent a further incoming of steam from the boiler, so long as the steam remains at the desired pressure; but so soon as the lesser pressure of steam on the larger area will not sustain the valve in its seat, a fresh influx of steam will be admitted, and make up for the decreased pressure, and thus will be maintained a constant supply of steam at the pressure desired to each vessel or chamber where the steam is used.”

[Printed, 4½d.]

A.D. 1853, May 27.—N° 1304.

SHIPLEY, SAMUEL SMITH.—“Improvements in cases or receptacles for containing a composition shaving soap, or other articles.”—*This invention did not proceed to the Great Seal.*—It consists in producing cases, &c., in “circular or other shape glass, or other tubes, measuring about  $\frac{7}{8}$ ths of an inch in diameter in the clear, and  $1\frac{1}{4}$ th of an inch on the outer diameter, and 3 inches in length. At one end of this tube place a ring or hollow ferrule, with a set off or flanch at one end projecting inward, which flanch is about  $\frac{1}{4}$  of an inch wide. This ring or ferrule which, in its inside, is of the precise size or diameter of the outer diameter of the tube, is placed on and cemented firmly at one end thereof. This being done, it will be evident the flanch of the ferrule being  $\frac{1}{4}$  of an inch wide, and the thickness of the metal tube of glass being only  $\frac{1}{8}$ th of an inch thick, that there will be at that end on which the ferrule is fixed a projecting ledge or set-off within  $\frac{1}{8}$ th of an inch wide. It is now intended to place within the tube a circular washer of metal, glass, or porcelaine, about  $\frac{1}{8}$ th of an inch in thickness, and a trifle smaller in diameter than the inner diameter of the tube, so that when dropped into it will fall down upon the projecting flanch of the ferrule within, and take its intended resting place thereon; the piece of circular composition soap, which has been prepared and moulded of the desired shape, diameter, and length, is now placed within, which fills up the tube. A capsule or cover of metal, about  $\frac{1}{4}$  of an inch in depth, is now nicely fitted and placed over the top of the case or tube, which renders the same complete for the market.” “Porcelaine, horn, bone,



320 INDIA RUBBER AND GUTTA PERCHA :

" ivory, metal, gutta-percha, or any other material or materials," are used in making " any part or parts of the apparatus."

[Printed, 2½d.]

A.D. 1853, May 28.—N° 1318.

BATEMAN, DANIEL. —"Improvements in carding wool and " other fibrous substances, and in the manufacture of cards for " that purpose;" these are, first, "the introduction of steam into " the interior of carding cylinders or cylinders covered with cards, " and employed for carding wool, and other similar substances."

Second, "manufacturing cards (to be applied to such heated " carding cylinders) with backs composed of metal combined with " vulcanized india rubber, or with cotton, linen, or woollen cloth, " or with any combination of these materials, and the application " of the same."

[Printed, 3½d.]

A.D. 1853, May 30.—N° 1325.

BROWN, JOSEPH. —"The improvement of elastic spring beds, " mattress's, cushions, and all kinds of spring stuffing for uphol- " stery work generally, making them lighter and more portable." Instead of the spiral springs now in use for the above purposes, sub- " stituting india-rubber straps, or webbing made of elastic material, " to be fixed horizontally or otherwise to the article required to " be stuffed ; the method of fixing the straps may be by sewing or " nailing them, or by loops, or buckles, or straps. The stuffing " to be attached to the webbing." "In making cushions or " mattresses for carriages, or for use on board a ship or other- " wise," "suspend them with the elastic webbing or straps to " counteract the oscillation of ships or carriages."

[Printed, 10½d.]

A.D. 1853, May 30.—N° 1326.

WELLS, GEORGE. —"The combination of materials for making a " more perfect fabric for suction hose, mill bands, harness, and " for all other similar purposes to which the same may be applied." —*This invention did not proceed to the Great Seal.*—It consists in the application of " india-rubber and gutta-percha combined for

“ the covering of woven suction hose, made of any fabric to render them air and water tight, and also the application of galvanized or tinned spring wire lining to such hose, and also the application of india-rubber and gutta-percha to all description of woven mill bands, engine bands, harness, and woven articles of the like description.”

[Printed, 2½d.]

A.D. 1853, May 30.—N° 1330.

GREEN, WILLIAM.—“ Improvements in treating or preparing yarns or threads;” these are, first, “ in certain modes of applying color so as to produce a greater depth or intensity thereof than is ordinarily obtained.” Second, “ in producing glossy effects upon yarns or threads, by covering such yarns or threads over their entire surface with metallic powder.” Third, “ coating yarns or threads with metallic solutions, pigments, or compositions.” Fourth, “ certain modes of burnishing or brightening yarns or threads.” Fifth, “ producing figured or ornamented fabrics by printing or otherwise imparting a metallic line or pattern, or a line or pattern in dry powdered colors generally, upon yarns or threads.” In carrying out the above improvements, “ the thread to be prepared is first dyed in the usual way, passed through the flame of a gas burner to remove all loose filaments from its surface, and “ passed into a trough containing size, dressing paste, japanners’ gold size, burnt oil, or other adhesive matter;” afterwards passing “ between pads of leather, or india rubber, or other soft substance,” to remove any superfluous quantity of the size that might adhere thereto.” The thread then passes into the colour boxes, attached to which are pads made “ of india rubber, leather, or other soft substance,” which press “ lightly on the threads,” &c. &c. The boxes may contain metallic powder, &c. In burnishing or brightening thread, after drying, it is passed “ between two polished surfaces of steel or agate,” &c. In “ producing figured or ornamental fabrics,” &c., machinery is described in which is a series of rollers for “ taking up, distributing, and “ applying burnt oil,” &c., to the yarn as it passes through the machine, some of which rollers are covered with vulcanized india rubber, &c.

[Printed, 7½d.]

## 322 INDIA RUBBER AND GUTTA PERCHA:

A.D. 1853, May 31.—N° 1334.

**BROOKES, WILLIAM** (*a communication*).—"Improvements in "stoves and grates, or fire-places;" these consist "in applying "glass, silvered on the inner side, to stoves, grates, and fire- "places, as a means of ornamenting, and of reflecting, and "radiating the heat from the fire." In fixing the glass, "ornamental metal or other mouldings" are employed, "be- "tween which and the glass are "pieces of cork, india-rubber, "or other elastic material, to prevent injury to the glass "in putting the parts together, and pieces of cork, or other "elastic material, are also applied at parts of the surface of the "glass, next the frame of the stove, grate, or fireplace, for the "same purpose. The cork, or other like non-conducting mate- "rial, also serves to prevent the too free conduction of heat "to the glass from the metal. The mouldings are affixed by "screws."

[Printed, 4d.]

A.D. 1853, June 2.—N° 1360.

**NEWTON, WILLIAM EDWARD** (*a communication*).—"Improve- "ments in the manufacture of soles for boots, shoes, and other "coverings for the feet;" these are, first, "making or forming "or moulding of soles of india-rubber or gutta-percha in moulds "or patterns on a roller, by the pressure of the periphery of one "or more rollers against the material while passing between them, "by which means it is forced into the mould, thereby at once "receiving the form, shape, and thickness of the pattern or "mould, and those parts cut out or engraved therein, and consti- "tuting the fore part, shank, and heel, and channel of the sole." Second, "making or forming of a continuous sheet of soleing of "india-rubber or gutta-percha, consisting of fore part, shank, "and heel, by means of two or more rollers or callenders, and "then cutting it out in the shape of the sole by passing it "between other rollers, having on them patterns or outlines of the "shape of the sole, by which it is cut or moulded in that shape." Third, "making soles "by means of a continuous plain sheet of "the above materials, portions of which, while passing between the "rollers, are pressed into the moulds on the rollers, where it is "moulded into soles, or by other equivalent means by which the "same effect may be produced." Fourth, "the openings or chan-

“ nels in the mould, through which a connexion is left between  
 “ the plastic materials in the mould and the sheet, and by which  
 “ the sole may be withdrawn from the pattern or mould.” Fifth,  
 “ making of a continuous sheet of soleing, or materials for  
 “ making soles,” “ by means of rollers or calenders heated by  
 “ steam or other equivalent means, by which the materials in  
 “ passing between them are heated or preserved in a heated, soft,  
 “ and plastic state, fitted to receive impresrions of or be moulded  
 “ into soles.”

[Printed, 7½d.]

A.D. 1853, June 3.—N° 1367.

DAFT, THOMAS BARNABAS.—“ Improvements in inkstands;”  
 these consist in “ combining with an ink vessel or ink-holder a  
 “ tube with a dipping cup at its upper end, there being a collar  
 “ or stopper formed on the tube which fits into an opening at the  
 “ top of the ink vessel. The tube descends from above into and  
 “ nearly to the bottom of the ink vessel through the opening, and  
 “ by the compression of the air therein the ink is forced into the  
 “ dipping cup, and by raising the dipping cup the ink descends  
 “ into the ink vessel. The opening through which the tube  
 “ passes is lined or formed with vulcanized india rubber.”

[Printed, 5½d.]

A.D. 1853, June 6.—N° 1392.

BARKER, DELABERE.—“ Certain improvements in the manu-  
 “ facture of blinds, shades, and other screens from glass and  
 “ other vitreous substances; also in the method or methods of  
 “ raising, lowering, folding, and regulating such blinds, shades,  
 “ and other screens.”—*This invention is void by reason of notice to  
 proceed not having been given within the time prescribed by the Act.*  
 —It consists in “ forming blinds, shades, and screens ” of glass,  
 or other vitreous substance or substances, of various shapes, and  
 of any color or colors ” “ adapted for the purpose.” These slabs  
 or prisms are affixed within a frame of wood or other suitable  
 material or materials; and in such frame insert one or more  
 wheels, both at the top and bottom thereof, to allow of the free  
 working backwards and forwards of the slabs or prisms, thereby  
 regulating the intensity of light required.” “ In some cases

324 INDIA RUBBER AND GUTTA PERCHA:

" attach washers of india rubber, brass, or other suitable materials to the upper or lower ends of both of such slabs or prisms, " to prevent them grazing against each other." " For the raising, lowering, and regulating some blinds," " use cogged, ratchet, or other wheels, by which means such blinds are prevented from breaking or grating by being too quickly raised or lowered."

[Printed, 2½d.]

A.D. 1853, June 7.—N° 1394.

LEVERSON, GEORGE BAZETT COLVIN (*a communication*).—" A new application, construction, and arrangement of springs for carriages and such like purposes;" and, first, " the construction of springs by the combination of an elastic bar with compressible springs." The compressible springs are, " a tube or ring of vulcanized india rubber" or " a helical steel spring." " The elastic bar or spring of steel" is in the form of a curve with an adjustment of a compressible spring at each end. The action is as follows:—" When pressure is applied on the centre of the bar" " this bar is partially straightened, and its two ends are forced outwards" and press against the compressible springs.

Second, " The construction of springs by the combination of a toggle joint with compressible springs connected or jointed to a rigid bar." This is similar to the above, only, instead of a curved bar or spring, two straight bars or springs with a toggle joint are substituted.

[Printed, 7½d.]

A.D. 1853, June 8.—N° 1404.

HORROCKS, junior, JOHN, and HORROCKS, JAMES DUNLOP (*a communication*).—" Improvements in the manufacture of detaching or percussion caps;" these are, " making such caps so that the interior surfaces or lining may be flexible and elastic, " in order that a cap may tightly and closely fit different nipples," and " in a manner to be waterproof." For this purpose " gutta percha is believed to be the best substance," and the manufacture is as follows:—" Portions of woven or suitable fabric are cut into cross-like forms, and the gutta percha is used in the form of short cylinders cut from a sheet of gutta percha. The

“ fabric is placed over a perforated plate or die, each perforation  
“ having a forcer which, descending into the die, forces the fabric  
“ and the gutta percha in a plastic state into the die, by which  
“ each die produces a cap into which the detonating material is  
“ placed; and then a sheet of very thin metal (copper) is placed  
“ over the die, and by the descent of a cutting tool to each die  
“ a disc of copper is cut out, and the same is forced into the cap  
“ of gutta percha, and the periphery of the metal disc will be so  
“ raised in contact with the interior of gutta percha as to render  
“ the whole waterproof.”

[Printed, 2½d.]

A.D. 1853, June 9.—No. 1414.

BROOKES, WILLIAM (*a communication*).—“ Improvements in  
“ treating fabrics suitable for floorcloths, covers, and such like  
“ articles;” these consist “in coating fabrics with saponified  
“ fatty matters, metallic salts, and dissolved or decomposed india  
“ rubber, combined together and applied in substitution of the  
“ ordinary coatings to floor cloths, tarpaulins, and other covers,  
“ and such like articles.” “The mode of decomposing india  
“ rubber which it is preferred to adopt is obtained by putting  
“ india rubber in small pieces into oil (by preference, olive oil),  
“ and heating it to a temperature of about 300° Fahrenheit until  
“ complete solution is effected.”

“ Coloring matters, and also thickening matters, may be mixed  
“ with the compounds. The matters which have been found to  
“ answer well as thickening are whiting, cream of lime, and lamp  
“ black, to be added to the above in such proportions that, whilst  
“ it is in a plastic condition by the heat applied to it, it may be  
“ applied by a brush.”

[Printed, 2½d.]

A.D. 1853, June 10.—No 1420.

FRANKHAM, SAMUEL. — “ An improved construction of  
“ coupling joint, applicable to pipes, vessels of capacity, and other  
“ like uses;” this is a mode “of producing coupling joints that  
“ will allow for contraction or expansion, and prevent the tearing  
“ away of the bolts or other fastenings employed in securing the  
“ connexion ” “by casting on the ” “ ends of the parts that are

326 INDIA RUBBER AND GUTTA PERCHA :

“ to be attached together (say, for example, tubes,) lugs or flanges  
“ for receiving the coupling bolts;” and the extremities of the  
“ tubes are shaped so that a suitable recess will be formed  
“ between the abutting ends for the reception of india-rubber  
“ packing, which will yield and expand as the pipes contract or  
“ expand in length; and thus a water-tight junction will be  
“ effected not liable to disruption from the action of varying  
“ temperatures.”

[Printed, 5½d.]

A.D. 1853, June 16.—No. 1461.

CHRISTOPHER, WILLIAM, and GIDLEY, GUSTAVUS.—

“ Improvements in abstracting sulphur and other matters from  
“ vulcanized indian-rubber;” these are “ removing sulphur from  
“ vulcanized india-rubber manufactured articles, and also from  
“ refuse or spoiled vulcanized india-rubber cuttings, parings, or  
“ old manufactured articles, and of redissolving the same for new  
“ purposes.” This is effected by “ macerating the vulcanized  
“ india rubber in a hot solution of carbonated alkali, or in a  
“ solution of hydrate of lime, or in hot water in which caustic  
“ lime is suspended, till, through the action of the alkali or of the  
“ lime, the requisite quantity of sulphur is abstracted; that is,  
“ either as much sulphur withdrawn as reduces the relative pro-  
“ portions of the sulphur and the caoutchouc to those required  
“ for any special purpose, or so far removes the sulphur as to  
“ leave the residual material in a condition to be acted on by the  
“ usual solvents or softeners of caoutchouc, so as to adapt it for  
“ reformation into manufactured articles, and of being revulcanized  
“ with sulphur or another material, if required.” “ To render  
“ vulcanized manufactured articles or the refuse more soft and  
“ pliable, they may be advantageously washed in a solution of  
“ water and fullers’ earth.”

[Printed, 3½d.]

A.D. 1853, June 16.—No 1466.

BROOMAN, RICHARD ARCHIBALD (*a communication*).—“ Im-  
“ provements in machinery for sawing stone and marble.”—*This*  
*invention did not proceed to the Great Seal.*—It consists in “ giving  
“ the feed lift to the saw frame at or sufficiently near the centre of

“ the reciprocating motion or stroke, or at equidistant points from  
 “ the centre for the purpose of effecting the freer percolation or  
 “ introduction of sand, or other gritty materials, and water; also  
 “ in repeating the feed lift of the saw blades by means of two or  
 “ more double inclined planes or projections, or their equivalents,  
 “ at each stroke; also in interposing india-rubber or other elastic  
 “ medium between the iron ways and the double inclined planes  
 “ or projections which lift the saw frame, to absorb or reduce the  
 “ effects of the concussion; also in giving a proportionate feed  
 “ by means of adjustable friction palls in connection with an  
 “ adjustable eccentric; and also in guiding the saw frame by  
 “ means of excentric pins for the purpose of preventing lateral  
 “ motion in the same without injuring the guide posts.”

[Printed, 2½d.]

A.D. 1853, June 18.—N° 1483.

BESSEMER, HENRY.—“ Improvements in the manufacture of  
 “ waterproof or partially waterproof fabrics;” these are “ the  
 “ production of a fabric which is pervious to air, but which does  
 “ not admit of the passage of water readily through it.” This is  
 “ effected by “ coating cotton and other yarn or thread previous to  
 “ weaving the same into a fabric, with a waterproofing solution,  
 “ preferring for such purpose a solution containing india rubber  
 “ or resinous gums not soluble in water, by which not only may  
 “ great lustre be obtained, but the yarn or thread will be water-  
 “ proof. When dry the yarn or thread is to be woven into fabrics  
 “ in the ordinary manner, by which means the woven fabric will  
 “ be waterproof, or for the most part waterproof, and yet per-  
 “ meable to air.”

[Printed, 3½d.]

A.D. 1853, June 18.—N° 1492.

GILBEE, WILLIAM ARMAND (*a communication*).—“ A new mode  
 “ of ornamenting stuffs and paper.”—*This invention is void by*  
*reason of notice to proceed not having been given within the time*  
*prescribed by the Act.*—It consists “ in cutting out designs of  
 “ different sorts of tissues, such as wool, silk, thread, cotton, and  
 “ paper, and applying the same, by means of an adhesive com-  
 “ position consisting of gutta percha dissolved in a sand bath and



328 INDIA RUBBER AND GUTTA PERCHA:

" kept in a liquid state either above other stuffs or paper or  
" underneath, in which latter case a part of the material corre-  
" sponding with the form of the design has to be cut out so as to  
" produce ornaments and new designs, superseding embroidery  
" and serving for various purposes."

[Printed, 2½d.]

A.D. 1853, June 20.—N° 1508.

DEFEVER, CHARLES LOUIS.—"An improved preparation for  
" lubricating machinery."—*This invention is void by reason of  
notice to proceed not having been given within the time prescribed  
by the Act.*—It consists of a composition "principally of colza oil  
" and caoutchouc or india rubber, which is dissolved therein by  
" being submitted to a high temperature." "The oil is heated  
" in a suitable vessel to the required temperature, and when the  
" caoutchouc is added it will in a short time be completely dis-  
" solved; after which, while the mixture is still hot, it must be  
" filtered so as to remove the impurities. The preparation will  
" then be fit for use."

[Printed, 2½d.]

A.D. 1853, June 20.—N° 1512.

SKERTCHLY, JOSEPH, junior.—"Improvements in the appli-  
" cation of baths to articles used for resting the human body."  
"These are using and adapting "of a bath to the space below the  
" bottom or bedding of a bedstead, and also to the space below  
" the seat of a couch or sofa." "In place of the ordinary metallic  
" bath, any other kind of bath, as, for example, a folding or  
" flexible or india-rubber bath, may be employed."

[Printed, 5½d.]

A.D. 1853, June 22.—N° 1522.

AYCKBOURN, FREDERICK.—"Improvements in the manufac-  
" ture of waterproof fabrics;" these are, taking "a piece of woven  
" felted, or looped cloth or other fabric, or a piece of paper or  
" leather," and coating or covering the same in the manner de-  
" scribed in the Specification of Patent N° 1137, 1852, or "by any  
" other ordinary well-known processes, with india-rubber solution  
" or with choucha, marine glue, or other cement in suitable quan-

" tity or proportion, according to the nature of the fabric employed  
 " and in one or more coats or separate applications, according to  
 " the nature of the fabric employed, and in one or more coats or  
 " separate applications, according to the nature and purpose of  
 " the material to be proofed. Between each coat or application"  
 " drive off by heat, or allow to evaporate by exposure to the air,  
 " the volatile spirit contained in the solution or cement in the  
 " ordinary manner," and then "face the surface of the coating,  
 " covering, or preparation so firstly formed or applied (in one or  
 " more layers) by or with the gutta percha (in the form of a paste  
 " or solution, or in a plastic state), and heated to the requisite  
 " temperature for freely working the same (such paste or solution  
 " being also applied in one or more layers) by the ordinary pro-  
 " cess or processes, or any of them." "Both sides of the fabric  
 " or material may be similarly treated, in which case" "complete  
 " the process or processes on one side first, and afterwards those  
 " on the other."

[Printed, 2½d.]

A.D. 1853, June 22.—N<sup>o</sup> 1525.

TOPHAM, CHARLES.—"Improvements in apparatus for measur-  
 " ing liquids, gases, and other elastic fluids, and for regulating  
 " the flow thereof, which apparatus may also be applied to the  
 " obtaining of motive power;" these consist "in measuring  
 " and regulating the flow of liquids, gases, and other elastic fluids  
 " by means of a box or case fitted with a stop or stops, in each of  
 " which is a passage open for the outlet of water or other liquid  
 " or fluid employed through a slide, which is caused to reciprocate  
 " and open or close the passage, as may be required." Or "a  
 " semi-rotary valve may be employed, having four ways, two  
 " for the inlet and two for the outlet of the water to be passed  
 " through the meter." "In the centre of the case is mounted a  
 " piston, which is caused to oscillate upon trunnions by the force  
 " of the water to be measured, entering in at one side through  
 " the sildes or valves, and thereby fills the case. When the  
 " slides or valves become reversed, water is caused to enter at the  
 " opposite side of the piston, and in so doing it forces out the  
 " water on the other side through the exhaust port, until the  
 " whole of the water has been thus passed through the case and  
 " measured. The number of oscillations of the piston being

### 330 INDIA RUBBER AND GUTTA PERCHA :

“ indicated by an index or dial in front of the apparatus.”  
 “ The valve in connexion with the source of supply ” is constructed ” so as to regulate the flow of liquids or fluids to the meter, in such manner that the increase of pressure of the inflowing liquid or fluid shall act upon the valve, and thereby cause it to gradually narrow the orifices for the inlet to the meter.”  
 “ Instead also of the piston in the apparatus being employed only to register the quantity of liquid or fluid passed through it, it may be made to communicate motion to a shaft for purposes of power.” The valve in connexion with the source of supply has a spindle attached to it terminating in a button, which presses against a spring or disc of india rubber. When the pressure of the inflowing water is in excess, the india rubber is pressed into a hollow recess in the end casing of the valve, and at the same time the valve is forced into the cylinder, and thereby closes the orifices for the inlet of the water. “ Upon the decrease of the pressure of the water, the india-rubber disc returns the valve to the position in which it was first set.”

[Printed, 64d.]

A.D. 1853, June 24.—N<sup>o</sup> 1539.

LISTER, SAMUEL CUNLIFFE. — “ Improvements in washing wool and hair, also in treating and preparing, before being spun, wool, flax, cotton, and similar fibrous material.”—*This invention did not proceed, the Law Officer having refused provisional protection.*—It consists, first, “ in covering washing rollers with gutta percha or unvulcanized caoutchouc and their com-pounds, or similar material.” Second, “ in drawing fibrous material from combs by twist and rollers, or by a spindle.” Third, “ in drawing two slivers of cotton, flax, or silk from combs so as to give a long and short top.” Fourth, “ in carding cotton for combing without flats.” Fifth, “ in carding the noils, or the backing and milkings of cotton, and recombining them.” Sixth, “ in using combs for combing cotton with not more than five rows of teeth when fitted on by a lashing process ; also, for flax or silk in using combs having not less than ten per lineal inch.” Seventh, “ in working cotton, silk, or flax, by revolving or other combs, either controlled or not where the combs are fixed, and where the material is brushed from them, and not drawn off.” Eighth, “ in using combs for

AIR, FIRE, AND WATER PROOFING. 331

" cotton, silk, and flax with one end finer than the other, or a succession of combs, the first comb being coarser than the others."

[Printed 2½d.]

A.D. 1853, June 24.—N° 1546.

VALLS, LEON (*a communication*).—"Improvements in the production of printing surfaces."—*This invention is void by reason of the patentee having neglected to file a specification in pursuance of the conditions of the Letters Patent.*—It consists in producing "printing surfaces which may be employed for various printing purposes, such as for printing calico or textile tissues or fabrics, paper hangings, and other purposes for which wooden or metal blocks are usually employed," of "gutta percha, either alone or in combination with caoutchouc or other ingredients." "A suitable plate having been engraved as a pattern either on wood or metal," "obtain a cast thereof by pouring thereon a very fusible metal or other substance suitable for taking a cast and producing a mould. A matrix or mould having been thus obtained, an impression thereof in relief is produced in gutta percha, or a combination of materials containing gutta percha, as one of its principal ingredients, either by melting the same, and pouring it on or in the moulds, and withdrawing it therefrom when cold, or the gutta percha having been prepared in the form of a thin sheet, may be softened by heat, and then placed on the mould or matrix; and by applying pressure to the gutta-percha sheet, the softened material will be forced into all the interstices of the mould or matrix, in which it must be allowed to remain until quite cold, when it may be removed."

[Printed, 2½d.]

A.D. 1853, June 27.—N° 1552.

HARLOW, ROBERT. — "Improvements in constructing and working valves for baths, wash-stands, and other purposes;" these are, first, "in the application of tubes made of vulcanized india rubber or other elastic material to the spindles of valves, in order to dispense with stuffing boxes." Second, "in working the valves for baths and wash-stands," &c. The tubes are "fixed above to the spindles, "and below to a boss projecting

## 332 INDIA RUBBER AND GUTTA PERCHA:

"from the chamber." By turning a handle in one direction a tappet depresses the spindles, and opens the valves, and turning it in another direction removes the tappet from the top of the spindles, and the tubes, acting like springs, raises the spindles so as to bring the valves against their seating.

[Printed, 5½d.]

A.D. 1853, June 27.—N° 1553.

**BROOMAN, RICHARD ARCHIBALD** (*a communication*).—"Improvements in printing or in producing designs and patterns of stuffs and fabrics;" these are, "printing or producing" designs and patterns on stuffs and fabrics by first "printing or impressing thereon the required design in a resinous substance or composition subsequently rendered adhesive by heat, or by being partially dissolved, and then applying thereon metal powder, metal leaf, flock, powdered colors, and other dry powder," "alone, or in combination with ordinary color printing, or with dyeing." "Every resinous substance will answer more or less well;" "but the resinous substance which has been found to answer best is a compound formed of gutta percha, bitumen, and assam gum, the proportions of which may vary according to the size and thickness of the lines in the pattern to be produced." "This compound is reduced to a fit state for printing by being dissolved in naphtha or other solvent. Instead of being dissolved, the resinous substance may, in some cases, be reduced to a fit state for printing with by the application of heat; but it is found preferable to use it in solution."

[Printed, 5½d.]

A.D. 1853, June 30.—N° 1576.

**RICE, WILLIAMS**.—"Improvements in harness for horses and other animals, and in the manufacture of springs for the same;" these are, first, "in the application or addition of springs to certain parts of harness to the traces, either at the one end next the hame, or at the other end next the splinter bar, or other part of a carriage to which traces are usually attached or made fast, to the back or bearing chain or strap, and to kicking straps, by means, in each case, of suitable hooks, eyes, buckles, or other convenient fastenings." Second, "constructing springs

“ for harness ” “ of a compound or sliding metal framing, cased  
 “ or otherwise, and of one or more blocks or pieces of vulcanized  
 “ india rubber, or of steel in a helical or other form, and of suit-  
 “ able hooks, eyes, or other fastenings for securing or using the  
 “ same, and so arranged, disposed, and combined together that,  
 “ on the force of a horse or other animal being applied, the india-  
 “ rubber or the steel will be compressed, and on such force ceasing  
 “ will return to the original form or shape.”

[Printed, 54d.]

A.D. 1853, June 30.—N° 1581.

SPOONER, WILLIAM CHARLES.—“ Improvements in drills for  
 “ agricultural purposes;” these relate, first, “ to the general  
 “ arrangement and construction of ” a “ water drill.” Second,  
 “ The application and use ” of a “ separate water tank, in combi-  
 “ nation with a seed drill or manure distributor.” Third, “ the  
 “ system or mode of regulating the cocks of the water tank.”  
 The liquid is distributed “ into the soil in drills or rows at the  
 “ period of sowing by means of the gravity of the liquid, and  
 “ through pipes, and to the combination therewith of a seed box,  
 “ and manure drill, so that seed, manure, and water may enter the  
 “ soil in close proximity to each other.” “ The complete machine  
 “ consists of a seed box from which seeds are taken up by means  
 “ of cups in the ordinary way, and delivered into pipes which pass  
 “ into the soil; a manure box divided into as many divisions as  
 “ there are of coulters, the manure being discharged from the  
 “ lower part of each compartment by fluted rollers, or other  
 “ suitable means.” “ The manure is thus delivered into pipes  
 “ which previous to their terminating in the soil, receive not only  
 “ the seed from the seed pipes, but also the water or other liquid  
 “ from the water chamber and the water vessel, which is divided  
 “ into compartments corresponding to the number of coulters in  
 “ the drill, which compartments may or may not be formed so as  
 “ to communicate with each other.” “ From these compartments  
 “ the water passes into pipes of gutta percha or other suitable  
 “ material, the supply being regulated or shut off by cocks or  
 “ valves, all of which may be turned by the drillman at once.”  
 “ These pipes terminate in the manure pipes, so that the seed,  
 “ manure, and water pass into the soil in close proximity to each  
 “ other.”

334 INDIA RUBBER AND GUTTA PERCHA:

"By this mode" no power is employed in raising or discharging the liquid, and the expense and the labour attending the use of buckets and chains for that purpose is altogether "avoided."

[Printed, 5½d.]

A.D. 1853, July 1.—N° 1587.

SHEPARD, EDWARD CLARENCE (*a communication*).— "Improvements in magneto-electric apparatus, suitable for the production of motive power, of heat, and of light;" these are, "coupling up or combining the metallic circuits of" "several series of coils," being improvements in the apparatus described in the Specification of Patent No. 14,197, consisting "of peculiar means and combination of apparatus for coupling up the metallic circuits, by which induced currents of electricity are conducted to, and caused to decompose water, and thus to obtain with greater advantage than heretofore, gasses for the purposes of producing motive power, light, and heat." These improvements, together with the invention No. 14,197, are described in the "Abridgments of Specifications of Patents upon Electricity, &c." In constructing the machine "washers of gutta percha or other insulating matter" are employed to insulate eight copper rings, into which the electricity is conducted, wires are attached to these rings, which pass it into two wires, these two wires convey it into vessels of the water which is to be decomposed, a tube of gutta percha, or other suitable material, conveys the gas to another tube, "by which the gasses are conducted to actuate a suitable engine to produce power, or to produce light or heat."

[Printed, 1s. 10½d.]

A.D. 1853, July 2.—N° 1592.

BROOMAN, RICHARD ARCHIBALD (*a communication from Francois Perroncel*).—"Certain machinery for converting caoutchouc into circular blocks or cylinders, and for manufacturing the same into sheets." "The caoutchouc is first freed from impurities and foreign matters by any process now adopted for such purpose, and is then fed in between two iron cylinders or rollers, heated by currents of steam, hot water, or other heat-

ing medium. The rollers are caused to revolve and give out, on the opposite side, a thick sheet of caoutchouc, which is led on to a small roller termed the gathering roller, the axis of which is free to rise in a slot in the frame of the apparatus, while it is prevented rising too rapidly by means of a weighted lever pressing on the upper surface thereof. Immediately under the gathering roller is a hollow fixed roller, heated in the inside." Both the gathering roller and fixed roller are caused to revolve, and the caoutchouc winds itself round the upper gathering roller in the form of a solid mass or cylinder; the pressure exerted on the gathering roller, together with the heat from the fixed heated roller, causing adhesion between the several thicknesses, at the same time the pressure forces or squeezes out any globules of air that may exist in the caoutchouc." "When a cylinder of sufficient size has been thus obtained, it is transferred to another machine, together with the gathering roller; or it may be mounted upon a separate axis. It is then caused to revolve in front of a fixed knife or blade, which slices or cuts off a continuous length of the caoutchouc in sheets, varying in thickness with the setting of the knife, which slides in a bed, and can be regulated as required."

[Printed, 64d.]

A.D. 1853, July 5.—N° 1599.

DAVIS, MARCUS.—"Improvements in carriages, scaffoldings, and ladders, which scaffoldings and ladders are used as carriages;" these are, "imparting strength to tube for axles for common or rail roads, and tube employed in the construction of carriages and scaffolding," by means of thin pieces of metal, slip of flat bar, or hoop iron, &c., a spherical axle and double spherical axle, "and the combination thereof," "for all kinds of wheel and under carriage work." "The making of wheels in halves, formed with a dovetail contrivance, for biting and hugging the india rubber," with a "reservoir for feeding;" and the formation of the india rubber" with a "lip or pendant, by which it is gripped by the wheel or the dovetail contrivance, with combination of hard and soft rubber, or hard material and soft rubber combined or affixed together; and the adaptation of the wheels for the application of asphalte or other materials,"



336 INDIA RUBBER AND GUTTA PERCHA:

also "arched serpentine form of tubing in the construction of  
"carriages, and making of a noisy wheel of wrought T-iron."

[Printed, 9½d.]

A.D. 1853, July 5.—N° 1601.

FALL, JOHN.—"Improvements in the treatment of certain oils;" these consist "in dissolving common yellow resin, colophony, "burgundy pitch, terebenthine, or turpentine materials as they "exude from the tree, copaiva resins, and the products of the "distillation of all such resins, gum damar, gum thus, balsams, "wax, caoutchouc, gutta-percha, and such like resinous and "gummy matters, in oils procured by distilling coals, peat, petro-  
"leum, bitumens, asphalts, shales, blaes, schists, and other mineral  
"substances capable of yielding bituminous matters by the appli-  
"cation of heat, so as to thicken and improve such oils, and  
"render them suitable for lubricating machinery, manufacturing  
"wools, and the like animal substances, and other useful  
"purposes."

[Printed, 2½d.]

A.D. 1853, July 6.—N° 1612.

GASKELL, PETER.—"Improvements in elastic springs."—*This invention is void by reason of notice to proceed not having been given within the time prescribed by the Act.*—It consists as follows :—"Take a solid bearing of wood, metal, or any convenient mate-  
"rial, and cut it across in or about the centre; then bore a hole in  
"one of the said parts, and fix to the other part a plug to fit into  
"the said hole; then fill the hole partly with india-rubber or  
"similar elastic substance, so that the plug or pin being put into  
"the hole, and the body to be supported requiring elasticity being  
"fixed on the top of the said bearing, will spring by the elastic  
"force of the substance in the hole aforesaid;" or "make a slide  
"in the form of a wedge, passing between two outer plates, with  
"an india-rubber or elastic band encircling the said wedge and  
"plates, or, in other words, encircling the three plates, the two  
"plates being connected at the top part." "This may be fixed in  
"any convenient manner to the body requiring elasticity."

[Printed, 2½d.]

A.D. 1853, July 6.—N° 1616.

**WOODWARD, JOHN.**—"An apparatus for curling hair;" this consists "in substituting for the ordinary methods of curling hair  
" an apparatus or curler formed out of a small sheet or piece of  
" leather, india rubber, gutta percha, or other suitable material,  
" one end of which is rolled round a core of quill, wood, or other  
" light substance, and secured by stitching or cement. A piece  
" of elastic braid is passed through the core, having attached to  
" one end a clasp, and to the other end a bolt fitting into the  
" clasp. The object of this elastic braid is to keep the curler on  
" the hair." "The manner of using this curler is as follows :"  
—"The ends of the hair to be curled are laid between the rolled-  
" up portion and the free end of the curler, and the hair is wound  
" or curled round it. The ends of the elastic braid are then  
" brought over the hair, and attached by the bolt and clasp."  
"When it is desired to release the hair the bolt is withdrawn  
" from the clasp, and the curler is removed."

[Printed, 54d.]

A.D. 1853, July 7.—N° 1618.

**BATE, HENRY.**—"A new fire escape, which he denominates  
" 'The Ignevador.'" this consists "of a tube composed of  
" some durable and elastic material, such as canvass, rendered  
" capable of contracting and expanding by means of elastic  
" springs (vulcanized india rubber), applied in rows or otherwise,  
" externally. The tube must be of such a diameter, when ex-  
" panded to the greatest, as to admit of a very stout person  
" passing through, but capable of contracting to such a calibre  
" that it shall embrace sufficiently a very small child." "The  
" upper extremity of this tube is to be kept permanently open by  
" means of a ring of iron or some strong material, and in the  
" position it is intended to occupy should be on a level with the  
" uppermost floor of the house to which it is attached, access to  
" it being provided by window or doorway. The bottom of the  
" tube is to be supplied with a circular mattress or platform, of  
" about the same diameter as the tube itself, suspended by elastic  
" springs. This is denominated the buffer, and is placed to  
" receive the feet of the descending person, breaking the fall,

338 INDIA RUBBER AND GUTTA PERCHA:

" should he have descended with unsafe rapidity through the tube."

[Printed, 54d.]

A.D. 1853, July 8.—N° 1633.

ST. CHARLES, PHILIPPE POIRIER DE.—" Improvements in apparatus for measuring and indicating the distance travelled by cabs and other vehicles;" these are, employing "an index and train of wheels" placed "within or outside the cab or other vehicle." "The motion from the running wheel of the vehicle to the index train" is communicated "by means of an endless band or bands, for which purpose" place "a grooved pulley on the nave or other convenient part of the wheel, which is to be the driver, and conduct the endless band to a grooved pulley on the index, which is to receive the motion." "Instead of communicating the motion direct, it is better to use an intermediate shaft, with two endless bands for the purpose, which are arranged according to circumstances;" "instead of endless bands, chains or belts may be employed." "In using one band only to communicate motion from the driving wheel," it is desirable "to employ a tightening pulley to bear upon it, or to use an elastic band for that purpose." "Gutta-percha bands answer the purpose extremely well, but other matters may be employed."

[Printed, 54d.]

A.D. 1853, July 9.—N° 1635.

RESTELL, THOMAS.—" Improvements in walking-stick umbrellas, applicable also to parasols;" these consist "in the formation of an umbrella," or "parasol," "which may be used also as a walking stick." Their "construction is of the ordinary description, excepting that in some cases" "each end of the stick" are formed alike, and the thread of a screw is cut upon a small portion of their extremities." "One end of the stick part is made longer than the other, and forms the handle" "when the apparatus is used as such." "When used as a stick" they are "closed, and covered with an outer case made of a metal tube, or it may be made of a tube of vulcanized india rubber or any other suitable material." "One end of this case is closed with a knob or a handle of any device that may be

“ desired, which is free to turn round, so that the inner portion  
 “ having a thread cut upon it corresponding to the thread on  
 “ each end of the stick, shall, when the case is passed over the  
 “ closed umbrella or parasol, and the handle turned so as to  
 “ bring the threads of the screws together, render the two parts  
 “ firm, and prevent the case from being drawn off. When it is  
 “ desired to use the umbrella, the outer case is taken off by  
 “ turning the handle in the reverse direction. The umbrella, &c.  
 “ is then opened, and the case is caused to slide over the stick of  
 “ the umbrella until the handle is brought into contact with the  
 “ screw, when it is fastened as before described. In this case that  
 “ part of the stick which formed the point when used for walking  
 “ now becomes the handle, the umbrella, &c. being reversed.  
 “ Instead of using a screw at each end, a bayonet joint or any  
 “ other similar and suitable contrivance may be used, taking care  
 “ that the handle be made to suit such an arrangement.”

[Printed, 6½d.]

A.D. 1853, July 11.—N<sup>o</sup> 1645.

AGER, GEORGE.—“ An apparatus for holding and turning over  
 “ the leaves of music or music books.” It consists of four levers  
 turning freely on an axis. These levers have a vulcanized india  
 rubber spring attached to them, which has always a tendency to  
 draw them over from the right-hand side to the left, but they are  
 retained on the right-hand side of the instrument with the leaves  
 of the music between them, by spring catches or stops until  
 released in succession by triggers in communication with each of  
 the stops.

[Printed, 1s. 0½d.]

A.D. 1853, July 14.—N<sup>o</sup> 1669.

NEEDHAM, WILLIAM, and KITE, JAMES, the younger.—  
 “ Improvements in machinery and apparatus for expressing  
 “ liquid or moisture from substances ;” these are, taking a  
 number of slabs “ made of wood or other fibrous material, metal,  
 “ gutta percha, earthenware, or any other suitable material or  
 “ combination of material dissimilarly prepared or otherwise  
 “ dissimilarly arranged,” “ of an uniform length and breadth, and  
 “ cut grooves or channels on both surfaces.” “ Place these

340 INDIA RUBBER AND GUTTA PERCHA:

“ pieces in a strong frame, supporting each piece by placing other  
“ pieces of wood or other suitable material at the ends, the sides  
“ being entirely or partially open or closed, according to the  
“ nature of the substance to be operated upon,” “ then place  
“ between each pair of flat pieces a cloth or cloths, or other suit-  
“ able material connected with a pump, and force in the substance  
“ to be operated upon, employing a greater power than can be  
“ resisted by the moisture or liquid which is to be expressed, and  
“ which finds its way out along the grooves or channels.”

[Printed, 8½d.]

A.D. 1853, July 14.—N° 1674.

ST. ANDRÉ, ANDRÉ LOUIS JULES LECHEVALIER.—“ Certain  
“ improvements in packing goods, so as to increase the facility  
“ and safety of their transmission from place to place.”—*This  
invention is void by reason of notice to proceed not having been given  
within the time prescribed by the Act.*—It consists “ in adapting  
“ and employing cases composed of wood, metal, or other suitable  
“ material, and of a particular construction, for the purpose of  
“ containing goods required to be transmitted from one place to  
“ another, such cases being intended to constitute permanent  
“ envelopes for goods, instead of forming mere temporary cover-  
“ ings for the same, to be afterwards destroyed, and also being  
“ locked so as to keep their contents inaccessible except by means  
“ of the proper key, and moreover dispensing with the ordinary  
“ use of nails, string, &c.” “ When these cases are required for  
“ the transmission of fluid or liquid goods, they may have inside  
“ them a vessel composed of caoutchouc or other flexible material  
“ impervious to the passage of fluids, or of glass or earthenware,  
“ care being taken in such instances to form the sides or leaves of  
“ the case so that they may overlap and protect the interior vessel  
“ from injury.”

[Printed, 2½d.]

A.D. 1853, July 15.—N° 1688.

GOODYEAR, CHARLES.—“ Improvements in spreading or  
“ applying india rubber or compositions of india rubber on  
“ fabrics ;” these are, “ manufacturing waterproof fabrics where  
“ coarse surfaces are to be coated with india rubber or india

“ rubber compounds,” as follows, employing “ two heated rollers, the surface of one (the upper one) moving somewhat faster than the other. The under roller is coated with felt or vulcanized india rubber to offer an elastic bed or surface to the fabric which is being partially coated. The coarse fabric to be coated is conducted between these rollers, and is moved away by any convenient means; as fast as the rollers by their rotation pass the fabric between them, a quantity of kneaded india rubber from the kneading machine is placed on the surface of the fabric, and in the angle between the rollers, and by reason of the faster surface speed of the upper roller the india rubber will be caused to apply itself only at the more elevated parts of the surface of the fabric, and those parts will be slightly coated with india rubber, whilst the indented or more hollow parts of the surface of the fabric will be uncoated and not filled up. The fabric thus treated is then to have a complete covering surface applied thereto of india rubber or india rubber compound.”

[Printed, 34d.]

A.D. 1853, July 15.—N° 1690.

GOODYEAR, CHARLES.—“ Improvements in the manufacture of brushes and substitutes for bristles;” these are, “ forming the handles and backs of brushes by combining india rubber with sulphur, with or without other matters, and subjecting the compound to heat till the same is changed into a hard substance; and the making of substitutes for bristles consists of forcing such compound through perforations in metal plates, so as to obtain the same, when subjected to heat, in a state to be used as bristles.” “ The best compound for the purpose is two parts india rubber, and one part sulphur.” “ The temperature of the bath is to be raised gradually to about 230° of Fahrenheit in about half an hour, at which heat it is desirable to retain the compound for about one and a half hours, when the heat is again to be raised gradually to 295° to 305° of Fahrenheit, say in about four hours.”

[Printed, 34d.]

A.D. 1853, July 15.—N° 1691.

BESSEMER, HENRY.—“ Improvements in the manufacture and refining of sugar;” these are, constructing “ cylindrical sugar

## 342 INDIA RUBBER AND GUTTA PERCHA:

“ moulds having a moveable bottom, so that the syrups may  
 “ drain off from a surface whose area is equal to the body of the  
 “ mould.” “The mould may in consequence be made of much  
 “ greater height.” “This increased capacity of the mould will  
 “ render it” too heavy “to be handled by the workmen in the  
 “ usual way,” “therefore they are made fixtures or moveable  
 “ only with revolving apparatus somewhat like a turntable; and  
 “ instead of detaching the loaf from the mould by a blow,” “an  
 “ hydraulic press or other suitable mechanical force” is employed  
 “ to push out the loaf from the mould.” “In carrying out the  
 “ above” “the moulds have a vertical slit or opening made on  
 “ one side of them, which extends from end to end; on each  
 “ side of this slit angle flanges are rivetted; there are projecting  
 “ pieces or lugs formed on the angle iron through which a screw  
 “ passes. A piece of vulcanized india rubber is put in between  
 “ the angle irons, so that when the screws are tightened, a close  
 “ joint will be formed, through which the fluid matters in the  
 “ mould cannot find their way,” and “on the bottom of each  
 “ mould a cap is fitted with a bayonet joint, and having a  
 “ piece of vulcanized india rubber between it, a sound joint is  
 “ formed.”

[Printed, 6½d.]

A.D. 1853, July 15.—Nº 1693.

GOODYEAR, CHARLES.—“Improvements in the manufacture  
 “ of pens, pencils, and instruments used when writing, marking,  
 “ and drawing;” these are, employing india rubber (caoutchouc)  
 “ in constructing or making pens, pencils, and instruments used  
 “ when writing, marking, and drawing,” by combining “india  
 “ rubber with sulphur, with or without other matters,” and  
 “subjecting “the same to heat to obtain a hard substance;” also  
 “combining “slate, powder, or matters (‘porcelain for white slates’)  
 “ with india rubber,” and thus obtaining “sheets or surfaces,”  
 “ to be written on with ordinary slate pencil, and for making  
 “ artificial slate pencil;” also forming or making “the articles  
 “ or parts of the articles above mentioned by employing such  
 “ compounds.”

[Printed 3½d.]

AIR, FIRE, AND WATER PROOFING. 343

A.D. 1853, July 15.—N° 1694.

GOODYEAR, CHARLES.—“Improvements in preparing india rubber;” these are, “subjecting india rubber in a divided state to an alkaline or acid process to cleanse the same of impurities.” The india rubber is cut in pieces, “by preference, in thin slices, which are put into a washing or fulling machine with water thickened with lime, flour, or other fine matter, for preventing the pieces of india rubber adhering when they are beaten, by which means some of the impurities are separated.” The pieces of india rubber are next subjected to chopping or cutting, to reduce the same to a grannular state, which is believed to be best done by means of machinery similar to what is used in paper making, employing solutions of potash or lime or strong acid, which will decompose the bark and foreign matters.”

[Printed, 2½d.]

A.D. 1853, July 15.—N° 1695.

GOODYEAR CHARLES.—“Improvements in the manufacture of beds, seats, and other hollow flexible articles to contain air;” these are, “the application of looped or knit fabrics (rendered air and water proof in the manufacture of air beds, seats, and other such like hollow articles.” “Two surfaces of such fabrics are coated with cement, and they are caused to adhere at intervals; but where the hollow cells are to be, paper is interposed to prevent adhesion, and bands of non-elastic fabrics are cemented between the fabrics to separate the cells. The cells may all be connected by a vulcanized india-rubber pipe, and be inflated by a cautchouc whalebone tube, or each row of cells may be inflated separately.”

[Printed, 2½d.]

A.D. 1853, July 16.—N° 1705.

DUNCAN, JOHN WALLACE.—“Improvements in adhesive soles and heels for boots and shoes, and in apparatus used for preparing and applying the same;” these are, first, “manufacturing soles and heels with a preparatory adhesive surface.” The soles and heels may be of leather, “gutta percha, caoutchouc



### 344 INDIA RUBBER AND GUTTA PERCHA :

" cattimundo, gum mudder," &c., " alone or combined with fibrous materials, textile or woven fabrics, cork, wood, horn, metal, glass, or earthenware," and are cut into shape, and coated on one side with a waterproof cement which, at natural temperatures, is free from stickiness. When applying them to boots, &c. they are warmed and pressed upon the boots, &c. The cement preferred is described in the Specification of a previous Patent, N° 906.

Second, " making goloe soles of a length and width sufficient to encase the lower part of the boot or shoe to which they are intended to be attached." These soles " may be formed of any suitable material, such as sole leather, cork, wood, metal caoutchouc in any state of vulcanization or combined with woven or fibrous materials. The rising edge is made of a more flexible substance than the bottom, in order to grip and be easy to the foot." " The material preferred is a combination of woven material with gutta percha, or its compounds," treated by heat, as described in the Specification of a previous Patent, N° 13,738, or gutta-percha sheet, described in N° 906, may be used. " Gum muddar or its combinations are also applicable."

Third, making " soles of leather, hardened sulphurized caoutchouc, or gutta percha, or other material perforated," and combined with elastic vulcanized gutta percha or caoutchouc, disposed so as to protrude through perforations, and appear in relief, so that the weight of the wearer may be sustained upon the elastic portion of the compound soles next the ground." In preference, these " soles and heels" are ornamented by " printing or stencilling various designs with adhesive cement upon the wearing face, and applying thereon either coloured flocks, powdered colours, metal powders, or leaf." Leather is prepared and conditioned, by machinery described, previous to passing it under " coating apparatus to receive the charge of cement. When the cement cools it may be perforated and embossed, as desired."

Fourth, " inserting studs through one or more thicknesses of material forming the sole or heel prior to application." " A series of taper half-round cutters fitted vertically to revolve so as to cut out the required number of holes" at one operation, is employed. " The studs may be " of stone, earthenware, or glass, coloured or otherwise," ivory, bone, horn, nuts, wood, shells, hide leather, hardened caoutchouc, or gutta percha."

Fifth, " for rasping or cleaning the soles preparatory to apply-

“ing the adhesive soles, form a brush or scraper made by inserting  
“sharp-pointed steel pins into a metal head or wooden handle  
“similar to a brush.”

Sixth, “holding gutta percha or other soles while being heated,  
“for applying to shoes, &c.” Using a “chamber or flat vessel,  
“with a raised flange or edge forming a recess in the side of the  
“chamber in which the sole rests. This chamber is filled with  
“cold water.”

[Printed, 41d.]

A.D. 1853, July 19.—N<sup>o</sup> 1711.

BRIMS, DONALD.—“An improved safety apparatus for the pro-  
“tection and preservation of life on water.” This consists of “a  
“boat and apparatus in sailing order,” all of a particular shape,  
build, and construction. The hull may be of “wrought iron,  
“wood, or other materials,” and is “covered all round and over  
“the ribs going over the top, with the skin rivited to them.”  
“There are only apertures in the top after the manner of man-  
“holes,” and which “are covered up from below by means of lids  
“or covers.” “When rowing with the oars” “the rowers can  
“either stand in the manholes,” or “sit on the top, as most con-  
“venient; but if the weather be very boisterous” the oars “can  
“be lashed,” “and the manholes shut up.” In this case “the  
“crew or passengers are supplied with fresh air by means of  
“the air pumps,” described, by a tube “which projects through  
“the top of the boat near the stern;” another tube enters near  
the same place. A screen or hood is over the top ends of these  
tubes, both of which pass up through a float with a coil of tubes  
particularly described. “These tubes are made of a peculiar kind  
“of chain covered with a covering of gutta percha, india rubber,  
“coated cloth, or other elastic pliable waterproof material. In  
“the hull, instead of covering from the floor to the seats with  
“matting or felting,” “use india-rubber expanding and collapsing  
“bags,” “or bags made of canvas or strong linen, coated with  
“india rubber or gutta percha, so as to render them completely  
“air-tight.” The mouths of the bags are fixed to the floor by a  
button of wood, iron, or brass, and “a solution of gutta percha  
“may be used to render them air-tight.”

A great number of arrangements for sailing, rowing, and pro-  
pelling and steering, &c. &c. are described.

[Printed, 111d.]

346 INDIA RUBBER AND GUTTA PERCHA :

A.D. 1853, July 20.—N° 1721.

COCHRAN, ALEXANDER.—“Improvements in finishing muslin “ and other fabrics;” and these are, heating the “irons” “em-  
“ ployed in ironing or smoothing and finishing muslins and  
“ other fabrics, whether in the piece or not,” “making the said  
“ irons hollow, and introducing steam [into them by means of  
“ india-rubber or other flexible tubing communicating with a  
“ steam pipe passing through the apartment in which the ironing  
“ operation is carried on.” “By these means the temperature of  
“ the irons is uniformly maintained, and there is no risk, on the  
“ one hand, of burning the goods from too great a heat, or,  
“ on the other, of the operation being inefficiently performed.  
“ from the gradual cooling of the iron.”

[Printed, 5½d.]

A.D. 1853, July 21.—N° 1723.

LILLEY, JOHN.—“Separating the refuse vegetable matter con-  
“ tained in the stalk and leaves of the plantain species, and also  
“ trees grown in tropical climates, from the fibrous material of  
“ the same, in order that the latter may be manufactured into  
“ ropes or cordage, and for other purposes for which hemp and  
“ flax are used;” and first, “fixing the knives or scrapers in con-  
“ nexion with the rollers.” Second, “the use of an elastic sub-  
“ stance for the knives or scrapers to act upon, and the governing  
“ of the action of the knives or scrapers by wedges.” The bottom  
“ of the frame “underneath the knives or scrapers” is covered  
“ with vulcanized india rubber or other suitable material.”  
Third, “the use of a comb in connexion with the rollers for the  
“ division of the fibre.” The comb is made “of steel, brass, or  
“ other suitable material, attached to where the inner knife or  
“ scraper is fixed.”

[Printed, 5½d.]

A.D. 1853, July 27.—N° 1766.

FONTAINEMOREAU, PETER ARMAND le Comte de (*a com-  
“ munication*). — “Certain improvements in the manufacture of  
“ tiles for roofing;” these are, “constructing tiles of metal, clay,  
“ glass, or gutta-percha, with a double channelling and over-

“lapping sides, by which greater strength and a more perfectly water-tight covering is obtained than by the ordinary mode of roofing.” The tile is “provided with two channellings, dividing the bottom of the tile into five nearly equal parts, and serving to draw the water towards the middle of the tile.” “A rim is made at the upper extremity of one tile, projecting about one fifth of an inch upwards from its face, and a similar rim made on another tile projecting at its lower extremity, which overlaps the former and forms the joint. The rims thus fitting the one over the other protect the tile most securely from the penetration of water or snow. The tiles are united sideways in the length of the roof, and prevent any shrinking.”

[Printed, 7½d.]

A.D. 1853, July 28.—N° 1771.

FORSTER, THOMAS.—“Improvements in the manufacture of boots and shoes;” these are, first, “the manufacture of boots and shoes with exterior surfaces of india-rubber or its compounds, with interposed leather or fabrics combined with linings of india-rubber or its compounds (vulcanized or not), in lieu of the linings of leather or fabric hitherto used.” Second, “the manufacture of waterproof boots and shoes having an interior lining of india-rubber or its compounds (vulcanized or not), the exterior surfaces being leather or a fabric.” “A lining suitable for the boot or shoe” is cut from a thin “sheet of india rubber, or of its compounds with sulphur or sulphurets, gutta percha, or any of those materials named” in the Specifications of Patents Nos. 10,407, 11,850, 11,917, preferring the “india rubber combined with milk of sulphur, as described in No. 11,850.

[Printed, 5½d.]

A.D. 1853, July 30.—N° 1785.

FONTAINEMOREAU, PETER ARMAND le Comte de (*a communication*).—“An improved method of producing an electric current.”

First, “in a new mode of insulating the electric battery and elements thereof.”

Second, “in a mode of arranging the electric battery and apparatus connected therewith, by which its cells are self-supplied with acid.”

## 348 INDIA RUBBER AND GUTTA PERCHA :

“ The cells of the troughs are rendered self-supplying ; the internal one with nitric acid, and the external one with diluted sulphuric acid, by means of two moveable reservoirs, which by their greater elevation allow their contents to flow into the said cells, which may empty themselves into the reservoirs by causing the latter to occupy a lower position. The porous vessels are provided at bottom with an opening, which, adjusted to a similar opening in the bottom of the trough, may communicate with it by means of an intermediate washer (tube) of vulcanized caoutchouc. The trough is also provided with another opening to allow the escape of the liquid. A tube, in the form of an inverted T, is adjusted to these openings, which have a socket form, so as to form one tube of the whole, which extends along the casing as far as the moveable reservoir, which is provided with a tap.” “ To effect the insulation of any of the elements put in communication by means of the lower conduct pipe, a piece is employed having the form of pincers, extending the whole length of the said pipe, and on approaching it by means of hinges, closes its sides at intervals between the inverted T pieces.”

[Printed, 10½d.]

A.D. 1853, August 1.—N<sup>o</sup> 1794.

LISTER, SAMUEL CUNLIFFE.—“ Improvements in machinery for washing wool and hair ;” these consist in covering washing rollers with gutta-percha or unvulcanized caoutchouc, or similar material, either in combination with other substances or otherwise ; also in causing wool or hair to pass through a washing bowl by means of a trough or spout, placed inside of a long washing bowl.” “ The wool or hair is fed to the spout by an ordinary feed cloth, and then is carried forward by revolving vanes, which cause the water and wool or hair to be constantly moving along the trough or spout ; and at the opposite end to that into which it is fed is placed an endless apron or cloth, which receives and carries the wool or hair forward to the expressing rollers, and by this means the wool or hair is constantly fed in at one end, and delivered at the other through the expressing rollers.”

[Printed, 5½d.]

A.D. 1853, August 2.—N° 1802.

PERKS, WILLIAM, Junior.—“ A new or improved tap for drawing off liquids.” “ The use of a tube of vulcanized caoutchouc or india rubber, or other sufficiently flexible air and water-tight material, bound or otherwise fastened at one end of the valve, and at the other to the cap of such taps as are opened and closed by a valve, raised from and pressed upon its seat by the rotation of a screw.”

[Printed, &amp;c.]

A.D. 1853, August 2.—N° 1804.

CLARKE, WILLIAM HENRY (*a communication*).—“ Improvements in the manufacture of a composition resembling ‘ papier maché ’ and ‘ carton pierre,’ and applicable to the same purposes to which ‘ papier maché ’ and ‘ carton pierre ’ are applied, parts of which invention may also be applied to the construction of ships and boats and roofing;” and these improvements are said to consist, first, in the use of peat alone, or mixed with other substances generally employed in the manufacture of “ papier maché ” “ carton pierre.”

Second, in scenting or odouring of the material made as above, by mixing with it “ schale or schistal oil or essence, or of coal tar, naphtha, or of petroleum or mineral naphtha,” “ to prevent the attacks of destructive vermin.” “ Peat or turf, as free from decay as is possible, is selected,” and either submitted to “ careful elutriation,” or otherwise, according to whether the article to be made out of it is to be coarse or fine, and “ the clean vegetable organic matter resulting ” is reduced to a pulp or paste, by soaking it for a given time, and in a solution containing given quantities of potash and slacked lime, washing with water, and submitting it to a dilute solution of muriatic acid, after which it is pulped in the ordinary way, and, if necessary, bleached. “ From pulp so prepared,” “ hand ” or “ machine ” paper is made. When cardboard, millboard, or papier mâché are required, the sheets of paper are united, or the pulp is moulded in suitable moulds. When “ sheets or leaves ” are required “ for light roofing,” &c., “ a certain amount of a solution of caoutchouc or gutta percha and resin is mixed with it, which makes ” it to a “ great degree waterproof.”

350 INDIA RUBBER AND GUTTA PERCHA:

The said composition is called by the patentee "lignum spagnum," and to which, when it can be procured, will be added "a small proportion of peacerine or parrifine."

[Printed, 3½d.]

A.D. 1853, August 2.—N° 1807.

RAYMOND, MEAD TERRY.—"Improvements in apparatus for retarding and stopping trains of carriages on railways."—*This invention is void by reason of notice to proceed not having been given within the time prescribed by the Act.*—It has for its object "the interposition of a carriage between the locomotive engine and the train of carriages, in order to carry breaks and apparatus acting by elasticity in such manner that the breaks will ordinarily be applied to the wheels when the train is at rest, and the breaks will only be removed when the locomotive engine has moved a determined distance in advance of the train, so that should the locomotive, after being in motion, be stopped, whether by accident or otherwise, the apparatus acting by elasticity will cause the breaks of the interposed carriage to be put on or brought into action, and retard the progress of the train, and bring it to rest, or nearly so, before it comes up to the locomotive engine; the rope, chain, or band by which the interposed carriage is connected to the locomotive engine will at the same time be wound or taken up by elasticity as the interposed carriage comes up to the locomotive engine." "For these purposes bands of vulcanized india rubber are used both for putting on the breaks and for winding or taking up the band, cord, or chain which connects the train with the locomotive engine."

[Printed, 2½d.]

A.D. 1853, August 2.—N° 1808.

BOURA, MATTHIAS EDWARD.—"Improvements in supplying ships or other vessels with water, air, or ballast;" these are to introduce into a ship's hold a sufficient quantity of water to compensate the absence of cargo, and such water may be introduced gradually while the cargo is being discharged; "also ballasting life boats;" "or, in case of shipwreck, the bags can be removed from the hold, or wherever else they may be stowed

“ away, and being filled with water, and attached to the timbers  
 “ or spars of which a raft is composed, form a means of keeping  
 “ the raft steady.” “ In cases where the vessel, boat, or raft  
 “ requires to be lightened or supported, the bags ” “ are filled with  
 “ air, and so placed as to effect such purposes. The bags may be  
 “ used to carry fresh water as ballast instead of salt water, and  
 “ may be filled with the latter as the former is consumed on the  
 “ voyage, &c.” “ The bags will also answer for life buoys or  
 “ ordinary buoys. To make the bags,” “ take canvas or other  
 “ suitable fabric, and saturate it with a solution of india rubber,  
 “ or with a solution of gutta percha, or any other elastic gums in  
 “ solution ;” “ then cut them into such shapes or forms as may  
 “ be required ; then place between such pieces of cloth a layer or  
 “ layers of sheet india rubber or gutta percha, or the two com-  
 “ bined, or attach them together with a solution of india  
 “ rubber or gutta percha ; having thus prepared the material,  
 “ form them into bags or vessels of the required size, capacity, or  
 “ substance for ballasting of ships, or for other purposes above  
 “ mentioned.”

[Printed, 54d.]

A.D. 1853, August 4.—N<sup>o</sup> 1827.

WILSON, GEORGE FERGUSSON, and AUSTEN, ALEXANDER  
 ISAAC.—“ Improvements in the apparatus used in the manu-  
 “ facture of mould candles ;” these are, in preparing “ moulds for  
 “ casting moulded candles, such moulds being composed of glass.”  
 Such moulds or tubes are covered and protected “ with gutta  
 “ percha, either by wrapping and moulding around them a piece  
 “ of sheet gutta percha, using heat to join the edges together, or  
 “ by enclosing the glass pipe in a piece of gutta percha tube of the  
 “ requisite size, and applying heat so as to enable the one end to  
 “ be moulded about the tip of the glass, and so as to apply the  
 “ gutta percha firmly to the glass in all parts ;” “ draw over such  
 “ glass tubes a piece of vulcanized india rubber tube of the neces-  
 “ sary size,” or “ cover the glass tubes with a composition capable  
 “ of being applied in a partially fluid or pasty state, and of  
 “ hardening into a more or less firm body when dry or set.”  
 “ Over the casings apply, in some instances, a thin cylinder or  
 “ outer casing of tinned iron, zinc, or other suitable metal, so as  
 “ to protect the casing itself from injury. Such moulds may be



352 INDIA RUBBER AND GUTTA PERCHA:

"wicked and used in the same manner as the ordinary metal or glass moulds."

[Printed, 2½d.]

A.D. 1853, August 8.—N° 1847.

NEWTON, WILLIAM EDWARD (*a communication*).—"Improvements in horse shoes;" these are "making the horse shoe of two plates, and interposing india rubber or other elastic substances between them," "as described."

[Printed, 6½d.]

A.D. 1853, August 10.—N° 1859.

TAYLOR, JOHN GEORGE.—"Improvements in desks, work boxes, dressing cases, tea caddies, and similar articles, and in the arrangements and fittings thereof."—*This invention is void by reason of notice to proceed not having been given within the time prescribed by the Act.*—"It relates to the construction and ornamentation of desks, work boxes, and similar articles partly with the material used in the manufacture of what are technically known as 'agate buttons,' and for which a patent was obtained in the year 1840 by Mr. Richard Prosser. The body of the desk is made of any cheap common material, as pine wood, and it is then covered over with the 'agate' composition formed into sheets or ornamental pieces, so that the desk may have the appearance of being wholly or nearly composed of this material; or, instead of constructing a box of common material, a mere skeleton frame only may be employed, the sheets of ornamental material being held in position by such frame, so as in themselves to form the box or desk. And the same system may be carried out with sheets of glass, which may be silverised so as to give the article the appearance of being composed of mirrors throughout." "In the fittings of a writing desk the inkstand is arranged with an elastic cover piece of india rubber or similar material contrived to completely cover up the ink. Through the centre of this elastic diaphragm a small aperture is made for the entrance of the pen in passing down to the ink, and as this aperture fits to and embraces the pen, the latter is always kept clean and free from superfluous ink. And to give this elastic cover a better effect, it is made in two layers set one upon the

" other, and each slitted through at right angles to one another, so that the pen is more closely embraced."

[Printed, 2½d.]

A.D. 1853, August 11.—N° 1868.

DEWSNUP, THOMAS.—"Improvements in obtaining motive power;" these are, "the use and application of caoutchouc, or any composition thereof, with other elastic material, for the purpose of obtaining and applying power," as described. "On a frame" are fixed "two strong hooks," to each of which is attached a number of strands of vulcanized india rubber or other similar elastic material, the opposite ends of which are united to ropes or connections which pass round guide pulleys, and "are then attached to and wound on to separate drums" which encircle the shaft or axle upon which "the driving pulley" "is fixed." "The motive power is obtained by the contractile force" of the "elastic material after it has been drawn out or lengthened by winding the ropes or connections on the drums, which can be done separately, and their effect afterwards combined by means of "ratchet wheels" with catches, &c. This power is applicable "to watches" and "children's toys, where springs are used to give them self-acting motion;" also to "turn mangles, coffee mills, or any similar apparatus," and "for applying or detaching the break blocks to railway carriages."

[Printed, 5½d.]

A.D. 1853, August 11.—N° 1872.

NAYLOR, HENRY MOORE.—"Improvements in affixing postage and other stamps;" these are, apparatus for affixing the above to letters and documents." Such apparatus consists of a chamber "to receive a pile" of "stamps with the adhesive surfaces upwards, and the upper one is at all times in a position to be taken on to a letter or document when the same has been moistened by another part of the apparatus, which consists of a roller with a sponge or porous surface, and water is supplied thereto by another roller revolving in water, or having an endless cloth or fibres moved thereby through water, or the moistened sponge or fibre is lifted up by a lever or instrument.

## 354 INDIA RUBBER AND GUTTA PERCHA:

"The apparatus is closed in a case." "The under side of the cover of the chamber containing the adhesive stamps has a projection of vulcanized india rubber or other suitable material," which "offers a flexible and elastic surface for the envelope, letter, or other document about to receive a stamp to be pressed against it." In the lower part of the chamber containing the stamps is a piston which is worked upwards by a lever when a stamp is being pressed on to the document, envelope, &c. On releasing the lever the piston descends, by being drawn down by a fixed spring of vulcanized india rubber.

[Printed, 54d.]

A.D. 1853, August 12.—N° 1885.

BROOMAN, RICHARD ARCHIBALD (*a communication*).—"Certain new compounds which may be employed for mouldings, frames, and many purposes to which wood, papier maché, plaster, gutta percha, and other like substances are applicable;" and these compounds are made as follows:—First, a saturated hot solution of gelatine is mixed with a certain quantity of sawdust; and this is kneaded into balls upon a board by a workman with his hands, and the board moistened with a very strong solution of tan, called "oil of tan." When these balls become white they are sufficiently kneaded, and show that "the combination of the gelatine and the sawdust" with the oil of tan has "been completely effected," and is ready for various uses. They may be stained by chemical agents, so as to resemble woods. Compounds may "be produced by the mixture of sawdust, or ligneous or feculent powders, with vegetable or animal oils."

Second, "mixing sulphate of iron, or some other metallic" sulphate, with gelatine dissolved in warm water," and thus producing a new compound "insoluble in cold water, spongy," and "having a soft or velvety surface."

[Printed, 34d.]

A.D. 1853, August 12.—N° 1886.

BROOMAN, RICHARD ARCHIBALD (*a communication*).—"A method of obtaining impressions from dies and other engraved and figured surfaces by stamping or pressure." It consists "in the employment or interposition of a plastic substance,

“capable of becoming softened by the application of heat or moisture, between the object on which the impression is to be produced and the pressing or stamping instrument by which the pressure or stamping action is applied.” “The substances may be gutta percha, caoutchouc, gums capable of softening by heat, a mixture of gelatine, sawdust, and tan oil, or of gelatine and sulphate of iron (such as the compositions described in the Specification of Patent, No. 1885.—1853), and, lastly, vegetable and animal oils, mixed in different proportions with wheat, flour, or any other feculent powder, or with sawdust.”

[Printed, 3½d.]

A.D. 1853, August 12.—N° 1888.

**TIZARD WILLIAM LITTELL.**—“A new combination or new combinations of materials suitable for buildings and other structures and parts thereof, and machinery for producing the same.”

First. “Producing a new combination or combinations of materials suitable for panels, doors, &c., by placing woven wire or perforated iron plates of the exact required size, or nearly so, or strips of metal or of woven wire or perforated iron plate, between boards or sheets of papier maché, straw board, or other similar materials, and screwing, rivetting, cementing, or otherwise fastening the whole together previous to painting or finishing the same in the ordinary way, so as to prevent an ordinary saw cutting through the material.”

Second. “Producing a new combination or combinations of materials for the manufacture of bricks, blocks, mouldings, &c. for building purposes, and of doors, panels, partitions, &c., and tiles, slabs, or plates for roofing and flooring, by combining plastic mixtures of earthy, animal, and vegetable substances with woven wire or iron sheets or strips perforated or otherwise, the plastic mixtures being on one or both sides of the same, according to the particular use for which the same are required.” The plastic mixtures which are employed are composed of lime, sand, chalk, and other like matters, brought to a suitable consistence with glue, size, india-rubber solution, &c., and having combined therewith hay, hemp, canvas, cotton, straw, tow, sawdust, &c., white lead, oil, or other like materials, the proportions being varied to suit particular cir-

356 INDIA RUBBER AND GUTTA PERCHA:

"cumstances. The mixtures having been spread or otherwise applied to the surfaces of the woven wire or metal are allowed to dry, and then smoothed, if requisite, and further treated by painting or otherwise, as required."

Third. "The machinery for the purpose of spreading or otherwise applying the said plastic compositions" "for the production of the articles before mentioned, consists of tables and rollers made hollow and heated by steam for the purpose of keeping the compositions in a plastic state during the operation of spreading, &c.," "which is effected by means of a spreading knife and pressing apparatus worked in conjunction with the tables and rollers so as to effect the even spreading and consolidation of the materials on the metallic surfaces."

[Printed, 3½d.]

A.D. 1853, August 12.—N° 1890.

TIZARD, WILLIAM LITTELL.—"Improvements in the construction of thermometers and other like indicators."—*This invention is void by reason of notice to proceed not having been given within the time prescribed by the Act.*—It consists "in attaching iron or glazed copper or brass bulbs or cylinders to glass tubes; also, in embedding the tubes in india rubber and other suitable material in metal and wooden cases, and in applying buffers of india-rubber or other elastic material."

[Printed, 2½d.]

A.D. 1853, August 13.—N° 1904.

JOHNSON, JOHN HENRY (*a communication from Louis François Alexandre Deseille*).—"Improvements in the manufacture or treatment of gutta percha, and in the application thereof."—*This invention is void by reason of notice to proceed not having been given within the time prescribed by the Act.*—It relates "to a peculiar preparation of gutta percha for rendering it either solid or liquid, and consists in the application of a carburet of hydrogen for liquifying it, and of any colouring powder, which is kneaded into it when it is required to be solidified." "The carburet is prepared from oil of tar." "By the aid of this liquid gutta percha may be readily dissolved, either warm or cold. By a small addition of alcohol to the carburet, and a little essence of lavender to dispel the smell of the carburet, a liquor is

“ obtained which has the property of removing all grease stains.”  
 “ Gutta percha thus rendered liquid may be applied to the construction of inking rollers for printing machines, and various other similar purposes.” “ By admixture with dissolved gum copale, an adhesive varnish is produced, which is equally applicable to wood or iron, effectually preventing the oxydation of the latter.” “ The liquid gutta percha may be also employed for rendering waterproof all kinds of textile or other fabrics For solidifying gutta percha, a coloring powder is kneaded into it, and the mass is then passed between suitable rollers. This substance may be applied to the construction of various articles, such as tubes, coffins, vases, statuettes, hafts, ornaments, boxes, and sheets for letter copying presses.”

[Printed, 2½d.]

A.D. 1853, August 13.—Nº 1905.

SCOTT, JOHN EDWARD.—“ Improvements in the manufacture of boots and shoes.”—*This invention is void by reason of notice to proceed not having been given within the time prescribed by the Act.*—It relates “ to the manufacture of shoes and other coverings for the feet, so as to ensure excellence of workmanship with economy of cost and rapidity of execution.” “ The soles are cut out of the leather by punches or cutters formed to the required sole shape, or the soles may be produced in any other convenient manner. The soles are then laid upon a metallic-faced last, with the upper leather and inner sole in position, and the soles and upper are then rivetted together by copper or other nails and rivets.” “ To prepare for this connexion the operator runs a perforating wheel or spurred disc round the line of the intended row of rivets. He then inserts the rivets in these holes, and clinches them in to bind the soles and upper together by hammering upon the iron face of the last.” “ The rivets or metallic connections are wedge shaped, and the pointed end being entered into the hole is clinched inside the sole, whilst the blunt or wedged end fixes well into the exterior of the sole.” “ The sole may either be rivetted directly to the upper, or a layer of cotton or other fibrous substance saturated with a gutta percha or other waterproof solution, may be laid in between the two surfaces to make a tight joint.”

[Printed, 2½d.]

A.D. 1853, August 16.—N° 1914.

FINCH, EDWARD, and LAMPORT, CHARLES.—“Improvements  
“ in the masts and rigging of ships ;” these are, first, “the  
“ mode of forming and strengthening ships’ masts by introducing  
“ vertical tie irons and angle irons, and of increasing the strength  
“ of these again by introducing vertical webs either attached to  
“ the angle irons or tie irons alone, or attached to these and  
“ attached also to each other.”

Second, “the application of an electric cushion of vulcanized  
“ india rubber, cork, or other elastic matter,” “to give an elastic  
“ support to a mast where it passes through the mast partners,”  
in the shape of “a collar or surrounding ring.”

Third, the use of a “plate at the head of the mast for faci-  
“ tating its construction for supporting the trestle trees and the  
“ foot of the top mast.”

Fourth, “the mode of shaping the head of the mast for shipping  
“ and unshipping the topmast, and for receiving the topmast.”

Fifth, “the mode of attaching the shrouds so that the strain  
“ shall be distributed.”

[Printed, 1s. 5½d.]

A.D. 1853, August 18.—N° 1939.

HUGHES, THOMAS.—“An improvement or improvements  
“ applicable to writing slates, pocket and memorandum books,  
“ and other such like articles.”—*This invention is void by reason  
of notice to proceed not having been given within the time prescribed  
by the Act.*—It consists “in applying a spring clip or holder to  
“ slates, memorandum and pocket books, &c., for the purpose  
“ of holding the pencil to be used therewith.” “In applying it  
“ to slates,” “attach a strip of sheet steel or other elastic sub-  
“ stance by one of its ends to the frame of the slate, and its other  
“ end, bent into a semi-cylindrical form, presses against the said  
“ frame.” “When the pencil is not in use, it is inserted under  
“ the loose end of the spring, and is held between it and the  
“ frame of the slate.” Or, “make the spring fastening of a strip  
“ of india rubber attached by its two ends to the frame of the  
“ slate.” It is “also applicable to memorandum and pocket  
“ books for the purpose of preventing the loss of the pencils used  
therewith.”

[Printed, 2½d.]

A.D. 1853, August 20.—N° 1944.

**KIMBERLEY, JAMES.**—"An improvement or improvements in  
" raising and lowering various kinds of window blinds, and in  
" opening and closing window and other curtains, applicable also  
" to the raising and lowering or winding and unwinding of maps,  
" and other sheets or articles, and to the closing of doors." A  
roller is supported by its ends in brackets, and "a line of vul-  
canized caoutchouc or other elastic material is attached at one  
" end," to a board or to the window frame over the roller, and  
the other end of the line after passing over a pully suspended over  
the other end of the roller is attached to the axis of a drum on the  
same end of the roller. By pulling down the blind wound on  
the roller, the line of vulcanized caoutchouc is coiled on the drum  
being elongated thereby, and a ratchet wheel and catch attached  
to the axis of the roller prevent the blind from being drawn up  
again until the pall or catch is disengaged from the ratchet wheel,  
which is done by pulling a cord attached to it, when the line  
" contracting, unwinds itself from the drum, and communicating  
" a rotatory motion to the roller winds up the blind."

This principle is applied to the other purposes mentioned in the  
title.

[Printed, 7½d.]

A.D. 1853, August 20.—N° 1948.

**VAUGHAN, WILLIAM, and SCATTERGOOD, JOHN.**—"Cer-  
" tain improvements in machinery, apparatus, or implements for  
" weaving." The object of this invention is said to be "the im-  
" provement of the power loom and self-acting temple;" and the  
improvements are stated to be thirteen, among which is "the use"  
" of elastic bands or straps formed of india rubber or caoutchouc,  
" or of elastic webs composed of strips or strands of india rubber  
" interwoven with some textile material, for the purpose of sus-  
" pending the heald shafts from the bosses of the heald roller,  
" and also of connecting them with the bosses upon the trans-  
" verse shaft," "to effect the elevation and depression of the  
" healds in shedding" and "suspending the cloth beam" "by  
" elastic bands or straps formed of caoutchouc or india rubber, or  
" of strands or slips of that substance interwoven with some  
" textile material into an elastic web. In looms wherein the



## INDIA RUBBER AND GUTTA PERCHA:

is taken up by two beams, the under or cloth beam is usually pressed against the emery beam by the short arms of levers, the opposite or longer arms of which are depressed with weights." "These levers and weights are dispensed with, and the bushes which carry the pivots of the roller are suspended by india rubber bands either from the pivots of the emery beam, or from studs in the framing provided for the purpose."

[Printed, 1s. 1½d.]

A.D. 1853, August 26.—No 1982.

VARROC, EUGENE DE.—"Certain means of depriving caoutchouc of all unpleasant odour, and of imparting to it various agreeable perfumes." The first consists in exposing caoutchouc or articles coated with it "in baths containing in solution, infusions, essences, decoctions, extracts, &c., of such vegetable matters as flowers, plants, and roots." The plants, roots, and flowers are verbena, flowers of lavender, "the root of the whorled flowered bent grass," camomile flowers, elder flowers, elder root, "root of Florentine iris or fleur de lis" in powder, ginger root, essence of birch tree, essences "composed with camphor on an alcohol base; also camphogenic acid, as it is called by Mr. Dumas, may be employed." "Tamarind leaves, black tea-leaves, leaves of various laurels, and orange trees, and sage, all of which may enter into the different solutions as bases, or combined with other leaves, grains, berries, and fruits which would be too tedious to enumerate here, but which nevertheless are claimed as contributing to the results. "Decoctions of the substances are made of certain strengths and are mingled together in given proportions; in some instances alcohol is added, and also small quantities of hydrochloric acid and sulphuric acid, and English honey and essential oil of lavender;" second, "subjecting caoutchouc, or articles coated with caoutchouc, to the action of currents of air or vapours;" third, "immersing the caoutchouc, or articles coated with caoutchouc, in containing solutions of lime." "For some purposes two processes are combined."

[Printed 8½d.]

TAYLOR

- an

- ex

- 7

- 1

- 2

- 3

A.D. 1853, August 27.—N° 1993.

**TAYLOR, SAMUEL.**—"Improvements in apparatus for generating " and applying carbonic acid gas." These are "arranging and " combining apparatus" so that "the pressure of the carbonic " acid gas for the time being in the apparatus regulates the " further evolution of that gas by admitting, retarding, or pre- " venting the combining of the acid with the matters from which " the gas is evolved." "The materials preferred to be used " are marble and dilute muriatic acid." The marble is placed in the bottom compartment of the apparatus, and the dilute acid is put in the upper compartment. The two compartments are divided by a hollow vessel in the upper compartment with a hollow plug at the bottom; in this plug are two apertures to allow the acid to flow in. The cover of the upper compartment presses upon a collar or step on the inner vessel, on which is a washer of vulcanized india rubber, and secures it in its place. By means of a hollow flexible tube attached to the hollow vessel in the upper chamber the gas generated flows.

[Printed, 5½d.]

A.D. 1853, August 29.—N° 2003.

**FONTAINEMOREAU, PETER ARMAND LE COMTE DE** (*a communication.*)—"Certain improvements in the production of " electricity." These are "the employment of hydrochloric acid " alone at different degrees of concentration, or hydrochloric and " another acid or saline solution for the two poles of a battery, " and in maintaining the strength of the hydrochloric acid by " the addition of gas of hydrochloric acid or of chlorine for ob- " taining a more constant and regular supply of electricity." In carrying out the above and when making " use of a battery with " cylindrical vessels the porous vessel is covered over with a plate " having three perforations. One of these perforations serves " for the introduction of the carbon; another for a tube " per- " manently set at top, and united to another tube " serving " to conduct the gas from a vessel " which receives it from a " suitable generator by means of an india-rubber or gutta-percha " elbow piece."

[Printed, 5½d.]

## INDIA RUBBER AND GUTTA PERCHA:

A.D. 1853, August 30.—N° 2006.

YEAR, CHARLES.—“Improvements in the manufacture of waterproof fabrics.” These are “combining fibres with india-rubber cement used in cementing fabrics together when making waterproof fabrics.” It is “desirable that there should be as much fibre mixed with the india-rubber cement as the cement will take, and yet be sufficiently fluid to spread freely on the surfaces of the fabrics which are to be cemented together.” “This mode of cementing fabrics together is peculiarly applicable to the cementing of fabrics made of fleeces or fibres combined into a fabric by india-rubber cement;” “in other respects the cement is to be used as heretofore, and the making of waterproof fabrics therewith is to be performed as heretofore.”

[Printed, 24d.]

A.D. 1853, August 30.—N° 2007.

GOODYEAR, CHARLES (*partly a communication*).—“Improvements in combining india rubber with other matters for writing, marking, and drawing.”—*This invention did not proceed to the Great Seal.*—It consists in “combining plumbago (black lead) with india rubber and sulphur, and subjecting the same to heat, in order to produce a change by which a compound is obtained, which, when made up into pencils, or other forms, is suitable for writing, marking, and drawing.”

[Printed, 24d.]

A.D. 1853, August 30.—N° 2008.

GOODYEAR, CHARLES.—“Improvements in rules, graduated scales, and measuring instruments.” These are making the above of the hard substance obtained by mixing “india rubber and sulphur with or without other matters,” and subjecting the mixture to heat in preference as follows:—“Mix two parts by weight of india rubber, and one part by weight of sulphur, with or without a small quantity of coloring matter;” “add no other foreign matter.” “Roll the compound into sheets of the thickness desired, and subject such sheets to heat between surfaces of glass or of oiled metal, applying the heat gradually, increasing up the temperature to about 300° of Fahrenheit in

“ about six hours, which may be done in any convenient manner.” “The sheets having been allowed to cool are then cut and worked into the desired forms for rules, graduated scales, and measuring instruments desired. In order to give greater strength, particularly (to) those which are jointed, insert strips of thin metal finely perforated, or of wire cloth, in the middle of the india rubber compound, from which the instruments are formed. This is done before heating, and serves not only to strengthen but also to assist in forming the joints of such rules and measuring instruments, the sheet of metal being left without perforation at the parts which are to form the joint.”

[Printed, 2½d.]

A.D. 1853, August 30.—Nº 2009.

GOODYEAR, CHARLES.—“ Improvements in the manufacture and ornamenting or coating of articles when compounds containing india rubber are used.” These are “ornamenting or coating articles composed of india rubber and sulphur (with or without other matters) by electro deposits of metal thereon.” The surfaces to be coated “must be rendered conductive.” This may be done by dusting plumbago or powdered metal “over the matter when in a plastic state, and pressing it into the surfaces when moulding, and by retaining the same in moulds till the process of heat has been performed.” “In addition to so applying plumbago or powdered metal, and pressing it into the surfaces, some plumbago or powdered metal may be combined with the india rubber when in a plastic state,” or “combine the plumbago or powdered metal with india-rubber cement, and apply a coat or coatings to the surfaces or parts of the surfaces where electro deposits of metal are to take place.” Also, “driving in pins of metal about the parts desired to be coated, in addition to applying plumbago over the surface, according to the device desired to be obtained in deposited metal, by which means the coating of metal which is produced will be held secure by reason of the pins.” “The surfaces of metal obtained on such articles may be polished or engraved, or otherwise treated, as is well understood in order to obtain the finished result desired.”

[Printed, 3½d.]

A.D. 1853, September 2.—N° 2029.

TAYLER, JOHN, GRIFFITHS, JAMES, LEES, THOMAS.—  
“ Certain improvements in steam boilers, and in apparatus applicable thereto, and to be used therewith.” These improvements are said to be fifteen in number. In constructing and applying gauges in connexion with boilers to indicate variations in the elastic force of the steam, two forms are described, “ in one  
“ of which the elastic force or pressure is denoted by the traverse  
“ of an index finger over a graduated arc; in the other, by the  
“ variations in the height of a column of mercury or other fluid  
“ contained in a glass tube, to which is attached a graduated  
“ scale.” The first is a small cylinder, through the bottom of which works a spindle, to the upper end of which is attached a boss or piston, secured by a nut. Between the boss or piston and nut the spindle passes through a disc of vulcanized india rubber, the external edges of which are confined between the upper flanches of the cylinder, while its centre is closely compressed between the nut and boss or piston, “ so that it forms a water-tight packing or joint, sufficiently pliable and elastic to permit  
“ the spindle to play freely, and at the same time separates the  
“ upper part of the cylinder so as to form a separate chamber.” The boss or piston rests on the top of a spiral spring, which resists its descent “ with a force gradually increasing with the  
“ compression which it undergoes. The bottom of the spindle has an enlargement and horizontal slot, through which projects the pin of a small crank fixed on a spindle, which latter passes through the front plate or dial of the gauge, and carries on its outer extremity the index or pointer. From the boiler is a passage by means of a pipe, into the upper chamber of the cylinder, above the india-rubber disc. This chamber and a short portion of the lower end of the pipe, contain water, which while it transmits the pressure of the superincumbent steam to the piston or boss “ prevents it from coming into the immediate contact with the india-rubber washer or disc.” The second form of pressure gauge may be described as follows:—A pipe communicates with the boiler or steam passage, and terminates in a chamber; above the latter, and separated from it by two india-rubber discs, is a cylindrical vessel, having an aperture opening upwards into a glass tube, open to the atmosphere. The edges of the india-rubber discs are confined between the flanches which join the lower

chamber and upper cylinder, and between them is a ball of metal porcelain, glass, or other hard substance. To the glass tube a scale is attached, and the reservoir and the lower part of the tube are filled with mercury or some other fluid." The chamber and a part of the pipe are occupied by water. The steam entering the pipe communicates through the water a pressure to the india-rubber discs commensurate with its elastic force, and pressing the discs into the reservoir, contracts its internal capacity, and raises the mercury into the tube.

In constructing safety valves it is proposed to apply a "lining or layer of cork or india-rubber to the valve seats, or to the part of the valve which rests in contact with the seat, but the former mode of application is considered preferable." "By forming a groove in the valve seat, and introducing the layer of cork or india rubber, in the form of a conical ring or washer, allowing its upper surface to rise about one-sixteenth of an inch above the surface of the metal." "Also, applying a new kind of safety-valve spring, whose adjustments, though open to ocular inspection, are secured from interference by a lock." "The spring consists of alternate layers or washers of india rubber and metal, through the midst of which, and through a cross-head, the valve spindle rises. The cross-head is forced down so as to compress the india rubber by the action of the nuts screwed on to uprights."

[Printed, 1s. 5½d.]

A.D. 1853, September 9.—N<sup>o</sup> 2083.

CHILDS, JAMES. — "Improvements in the manufacture of materials to render them suitable as substitutes for mill-board, and such like uses." These are "using very thin sheets of wood, preferring them to be of not greater thickness than eighty to the inch, and combining them with sheets of paper or fibrous materials by cement, the thickness of paper in some cases being thicker than the wood. The wood, in some instances, is perforated with numerous holes, and the grain in the succeeding sheets is placed in different directions. The cemented sheets are also, when desired, submitted to considerable pressure; the wood is boiled in or submitted to solutions of size or other matters to give adhesion and other properties, according to the nature of the solution employed." "The

“ most convenient means of puncturing the wood ” is, “ having one roller, with its periphery, covered very closely with very small projecting points, and a second roller covered with vulcanized india rubber or other matter which will admit of the points coming in contact with it, and to pass the sheets of wood through between such rollers; or, in place of fine points, numerous parallel fine edges may be used, or in place of rollers a like effect may be obtained to the wood by having points or parallel edges fixed on a flat pressing surface.” “ It is desirable to subject the surfaces of the wood to the action of an acid or alkali.” “ The acids are used to effect the separation of moisture from and harden the woody fibre and the cellular tissue, and thus arrest the power which wood retains so long of absorbing and giving out moisture.”

[Printed, 34d.]

A.D. 1853, September 12.—N<sup>o</sup> 2106.

TURNER, EDWARD RUSH.—“ Improvements in grinding mills for farm and other purposes.”—*This invention is void by reason of notice to proceed not having been given within the time prescribed by the Act.*—It consists “ in the employment of flat or conical plates of white cast iron or other hard metallic substance. These plates are of a disc form, the face surfaces of each being either flat or otherwise, as required. They are contained in a cylindrical box supported by a frame in which a vertical spindle passes and carries the lower plate, this spindle being actuated by suitable gearing. The lid of the box carries a hopper for the reception of the substance or material to be ground, and a feed roller and slide are fitted to the bottom of the hopper to regulate the supply. The teeth or grinding portions of the plates are cast on them, and radiate tangentially from a small circle in the centre of the plate to the periphery. The upper grinding plate is fixed to the lid of the cylindrical box by screwed studs, which allow also for adjusting the height of the plate which rests at these studs upon vulcanized india-rubber or other elastic washers. Similar washers are also placed on the face side of the grinding plate, between the plate and the stud rest. The centre of the plate rests, by a spherical convex ring, on a corresponding concave ring in the box lid, forming thereby a ball and socket joint; thus the plate is made self-

“ adjusting to any irregularity of pressure beneath it. The lower  
 “ and revolving plate has cast within it a wrought-iron eye,  
 “ which rests upon a shoulder on the vertical spindle to which it  
 “ is secured. The adjusting of the plates nearer or further from  
 “ each other is effected by a sliding beam, which carries the  
 “ upright spindle, and is actuated by a screw and wedge. The  
 “ above arrangement or construction of plates may be employed  
 “ also in a vertical mill as well as a horizontal one.”

[Printed, 2½d.]

A.D. 1853, September 12.—N° 2107.

LILLEY, JOHN, junior.—“ Improvements in mariners’ com-  
 “ passes.” These consist in withdrawing the fixed axes, and  
 “ attaching or suspending the outer ring of the gimbal by means of  
 “ bands of india rubber, one end of which is attached to the outer  
 “ ring, and the other to the sides of the binnacle, the said bands  
 “ making an angle of about 70 degrees with the horizon. These  
 “ elastic bands serve as non-conductors of motion ; and by these  
 “ means, although the binnacle itself partakes of the motion and  
 “ tremor of the ship or vessel, the card remains perfectly steady  
 “ and horizontal, and free to move in any direction, according to  
 “ the course in which the vessel is steered.” Instead of suspend-  
 “ ing the gimbal in this manner by means of india-rubber bands,  
 “ the same end may be attained by supporting it by means of  
 “ metallic springs, although the action of this arrangement would  
 “ not be so smooth and certain.”

[Printed, 5½d.]

A.D. 1853, September 12.—N° 2110.

NEWTON, ALFRED VINCENT (*a communication*).—“ An im-  
 “ proved manufacture of printing blocks and cylinders” by  
 “ forming the moulds into which printing blocks are to be cast  
 “ of rectangular or other shaped prisms, of a suitable size and of  
 “ two different lengths. These types or prisms are set up to  
 “ form the moulds in such a manner that the short ones shall  
 “ form the sunken part of the mould, and the long ones the  
 “ raised portion, so that when the material of which the block is  
 “ to be formed is cast into the mould, the elevated portion of the  
 “ mould shall form the depressed portion of the block, and the  
 “ depressed portion of the mould shall form the raised or figured



368 INDIA RUBBER AND GUTTA ERCHA:

“portion of the block.” “The types or prisms may be of ‘type metal,’ iron, copper, or of any other suitable material; and the printing blocks may be made of any material that, by fusion or by mixture with water or oil, may be rendered sufficiently liquid or plastic to be poured or forced into the moulds, such as ‘type metal,’ plaster of Paris, and clay, a mixture of shellac and fine sand, papier mâché, highly vulcanized india rubber, or gutta percha.” “The latter is the substance preferred.”

[Printed, 5½d.]

A.D. 1853, September 15.—N° 2146.

KNUTH, LUDWIG FREDERICK HERMANN CHRISTOPH.—“Improvements in the manufacture of purses, cigar cases, reticules, bags, tobacco pouches, and other similar articles.”—*This invention is void by reason of notice to proceed not having been given within the time prescribed by the Act.*—It consists “in making the sides or bodies of these articles of an elastic material, so as to increase their capacity and durability.” “The fabric proposed to be used for this purpose” “is made of silk and cotton, cemented together by a solution of caoutchouc, with a rib or web of the same material, and afterwards corrugated or crimped by being passed through a machine. Instead of silk and cotton, two pieces of cotton may be thus united by caoutchouc, and afterwards passed through a machine; or thin pieces of leather, or leather and cotton or silk, may be similarly treated and employed. The submitting the fabric to the action of a machine, consisting chiefly of a pair of corrugated or fluted rollers, causes both pieces to become incorporated, and adds to their elasticity.”

[Printed, 2½d.]

A.D. 1853, September 17.—N° 2166.

NICKELS, CHRISTOPHER, and SELBY, RALPH.—“Improvements in the manufacture of flexible tubes and bands, and in covering wire.” These are in the manufacture of flexible tubes and bands, and covering wire with gutta percha and matters requiring heat to keep them in a plastic state, “in place of employing a piston or forcer, as heretofore, in a cylinder, to force

" the matters through the dies, employing a pair of rollers which  
 " are caused to rotate constantly in a direction to take in and to  
 " force the matter or matters to and through the die or dies; the  
 " die or dies, apparatus and rollers, being kept heated by steam  
 " or other suitable means, so as to retain the matter or matters  
 " plastic." The axes of these rollers "are supported by and  
 " turn in bearings at each end of the machine." One of these  
 rollers "is capable of being moved towards and from the other  
 " roller."

[Printed, 1s. 1½d.]

A.D. 1853, September 20.—N<sup>o</sup> 2180.

POOLE, MOSES (*a communication*).—"Improvements in life pre-  
 " servers." These consist in "applying under the divided top of  
 " a stool or chair two or more cans or other buoyant articles, and  
 " in so arranging the seat that it can be opened longitudinally,  
 " and the two parts held together, when opened, by hinges or  
 " their equivalents in such manner that when open it is capable  
 " of enclosing the body of a person, the legs forming the sides,  
 " and the seat the two ends, of a species of rectangular frame;"  
 also "in a certain clasp or coupling so constructed and applied  
 " that it serves the purpose of holding the two halves of the stool  
 " in position either for use as a seat or as a life preserver;" like-  
 wise "in applying to these clasps a belt or strap which may, if  
 " desired, afford additional support to the party using the life  
 " preserver, while it at the same time tends to hold the coupling  
 " clasp firmly in its place." "A compact mass of cork, or two  
 " solid blocks of light wood, or two inflated india-rubber bags,  
 " may be substituted in place of the sheet metal cases and their  
 " cork packing, or these cases might be used without the  
 " packing."

[Printed, 5½d.]

A.D. 1853, September 27.—N<sup>o</sup> 2217.

BURY, ISAAC, and GREEN, WILLIAM.—"Improvements in  
 " treating, stretching, or finishing textile fabrics, and in machinery  
 " or apparatus for effecting the same." These are, first, "commu-  
 " nicating tension to textile fabrics when out of the loom in the  
 " direction of the warp and of the weft simultaneously, for the pur-

## 370 INDIA RUBBER AND GUTTA PERCHA :

“ pose of keeping them to their original size, or nearly so, in one direction while elongating or distending them in the opposite direction.” The material is drawn from a roller “over or between two pairs of rollers, one pair thereof being arranged at either end of an iron framework ;” one set of the rollers may be plain, and the other set being somewhat larger at their centres than at the ends,” “and having grooves turned around their circumference,” or otherwise. The fabric in passing “from one end of the machine to the other,” “passes between clips or bars suitably adjusted” and “capable of travelling in opposite directions (so as to be adapted to different widths of material) by means of screws working in the framework, and on the ends of which screws suitable handles or wormed or bevelled wheels are fitted for turning them.” “The side bars or clips may be either in one length, and faced with an elastic substance, or they may be composed of a number of parts fitted together on strips of vulcanized india rubber or other elastic material, so as to permit of their travelling with and receiving tension together with the fabric as it is being drawn from the machine.” The clips may have grooves on their surfaces “so as to ensure a firm grip of the material.” “When two sets of rollers are employed, the clips may in some cases be dispensed with.”

Second. Imparting pliability to textile fabrics “without the use of pin points on the sides of such fabrics,” &c. This is effected by a somewhat similar arrangement to the foregoing.

Third. “Removing certain colors from, and in imparting colors to, textile fabrics, whether the same are wholly or only partially woven, by forcing currents of hot air, or vapours, or gases, charged with various chemical agents, upon the same.”

Fourth. Employing “hot air for drying textile fabrics, whether the same are woven or only partially woven, when subjected to either of the before-mentioned operations.”

[Printed, 7½d.]

A.D. 1853, September 28.—N<sup>o</sup> 2227.

LABAT, JEAN ALEXANDRE, junior.—“An improved system of stoppering vessels and bottles.” The stopper “does not form part of the vessel, but is fitted to any vessel whose neck has the required size and shape.” The vessel or bottle has a metal

collar attached to its neck, the collar is chased with screw threads, and has two lugs to hold it by to prevent its turning round when screwing a cap upon it. The cap consists of a female screw to fit on the collar with a top which may be of sheet iron tinned or not, it has in its inside a washer of cork which acts as a cushion, "this latter is covered by a second washer" "made of tin foil" "or any other convenient metal, or else gutta percha, india rubber, parchment, &c."

[Printed, 7½d.]

A.D. 1853, September 29.—N° 2232.

GRIFFITHS, JAMES.—"Certain improvements in steam engines." These are, first, "constructing the slide in two parts, the conjoint depth of which is equal to the whole depth of the valve chest. The upper slide or face of the slide moves in contact with the inner surface of the cover of the valvechest. The lower side or face slides on the lower surface of the valve chest, covering the steam ports or passages in the usual manner. One of the parts into which the slide or box is divided contains a groove which receives the corresponding sides of the other part. The bottom of this groove is occupied by a strip or layer of caoutchouc or india rubber, vulcanized, which acts as a steam-tight packing, rendering the junction of the two parts of the slide or box impervious to the surrounding steam, and forming at the same time an elastic spring cushion, the repellent force of which, tending to separate the two parts, presses their outer faces into close contact with the corresponding surfaces of the valve chest, against which they slide. The pressure of the steam is thus removed from the upper side of the slide or box, the elastic force exerted by the india rubber acting as its substitute in keeping the working faces in contact."

Second. "To afford a more free and enlarged passage for the exit of the exhaust steam" by "permitting such steam to escape through the interior of the slide or box, and thence through the cover of the valve chest."

[Printed, 5½d.]

A.D. 1853, September 30.—N° 2237.

JOHNSON, JOHN HENRY (*a communication from M.D'Hondetot*).  
"—Improvements in apparatus for throwing out ropes or lines for

**372 INDIA RUBBER AND GUTTA PERCHA :**

“ the better preservation of life and property.” These consist in  
 “ fitting a capsule of caoutchouc or a combination of caoutchouc  
 “ with some other material, such as gutta percha, to the muzzle  
 “ of a cannon or other fire arm.” The capsule “ is attached to  
 “ one end of a line or cord ” “ which is passed through a hole  
 “ made transversely across the front end of the capsule, and  
 “ through lateral holes in its socket,” “ the free end being even-  
 “ tually joined to the main cord ” “ in a line with the axial line of  
 “ the capsule, so that the direction of its flight may not be inter-  
 “ fered with by any lateral or unequal drag upon it.” “ The  
 “ cord to be conveyed to a wreck, building on fire, or other place  
 “ of danger, is suitably coiled in a receptacle ” “ to allow it to pay  
 “ off freely.” “ On the musket being fired the ball enters a chamber  
 “ in the capsule, and carries it with it to its destination.”

[Printed, 34d.]

A.D. 1853, October 4.—N<sup>o</sup> 2265.

CROFTS, WILLIAM. — “ Improvements in weaving.” — *This invention is void by reason of notice to proceed not having been given within the time prescribed by the Act.*—It relates to “ improvements  
 “ on modes of arranging and combining machinery described in  
 “ the Specification of a Patent ” “ granted to the patentee 1st of  
 “ April, 1853,” “ in which it was proposed to employ two guide  
 “ bars, with their rows of guides, as a means of causing the warp  
 “ threads to recede from, approach to, and go past each other, in  
 “ order to open angular sheds for the passage of shuttles or thread  
 “ carriers.” “ It also consists,” “ when using several guide bars  
 “ carrying different rows of threads,” “ in employing strands or  
 “ threads of india rubber, which strands of india rubber are  
 “ to be placed in some of the central rows of threads, by which  
 “ they will be better covered by the other threads, and an elastic  
 “ fabric will be obtained.” Also “ applying combs or bolts to receive  
 “ the shuttles or other thread carriers placed at a like angle and  
 “ affixed to bars by which they may have an end-way shogging  
 “ motion given to them, as in lace machinery.”

[Printed, 24d.]

A.D. 1853, October 5.—N<sup>o</sup> 2275.

BETJEMANN, HENRY JOHN.—“ Improvements in apparatus  
 “ for fixing capsules on the necks of bottles and other vessels.”

These are, "combining apparatus for pressing capsules on the necks of bottles and other vessels." "For this purpose several cords or bands are used, each independent of the other. One end of each is made fast to the upper part of the apparatus, and is at its other end connected with a spring or other means of admitting of separate elastic action or motion; and each cord or band is at the same time capable of being pulled on by a treadle or otherwise. There are two sets of such bands or cords, and the cords in each set are bent in opposite directions. The bends of the neighbouring bands or cords of one set are caused to work between the spaces of the neighbouring cords or bands of the other set, by which means a tubular eye or opening is formed, into which the neck of a bottle or other vessel having a capsule on it is passed, when by pulling on the several bands or cords they close on the capsule, and cause it to assume the figure of the neck; and by reason of the neighbouring cords or bands being capable of independent action they can be caused to embrace a smaller or larger part of the neck. In order that the bent part of each cord or band may expand to release the neck, elasticity is given to or caused to act on such bent part." "The holder for the bottles or other vessels to be capsuled should have strips of vulcanized india-rubber within it, in order to offer additional contact, to insure the revolving of the bottle or vessel."

[Printed, 10½d.]

A.D. 1853, October 7.—Nº 2291.

ELLINS, GEORGE.—"New or improved machinery for thrashing or separating the stem and husk from the grain or seed of wheat, barley, flax, and other plants."—*This invention did not proceed to the Great Seal.*—It consists of "a table supported on a horizontal axis, on which it is capable of revolving, covered with transverse flutes or corrugations made of laths of wood or other material, supported on an elastic bed, so as to be capable of yielding. The laths have different depths, and are arranged so as to give a wave-like form to the surfaces of the table. The wheat, &c. to be thrashed is placed on the table (the table being previously fixed in a horizontal position), the ends of the stems thereof projecting from both ends of the table. A bar or flap is made to fall upon the ends of the

374 INDIA RUBBER AND GUTTA PERCHA :

" wheat, &c. stems to press them down, and a corrugated roller is  
 " passed over the said bar or flap on to the wheat, and is rolled  
 " several times backwards and forwards. By this treatment the  
 " grains are detached from the stems, and separated from the  
 " husks. On withdrawing the roller the bar or flap which held  
 " down the straw is removed, and the straw taken up from the  
 " table by bands of india rubber laid on the table previous to  
 " placing the wheat thereon ; the table is unbolted, so that it may  
 " move on its axis ; it is made to perform a half revolution,  
 " whereby the under surface is brought uppermost ; the grain  
 " falls on the floor with the husks, and another portion of wheat,  
 " &c. is placed on the table to be operated upon."

[Printed, 2½d.]

A.D. 1853, October 7.—N° 2294.

FERGUSON, JAMES, and LILLIE, JAMES.—" Improvements  
 " in trousers and similar articles of dress."—*This invention is void  
 by reason of notice to proceed not having been given within the time  
 prescribed by the Act.*—It is doing away with the use of "sus-  
 " penders or braces or other extraneous support." " For this  
 " purpose the waistband of the garment has inserted in it a piece  
 " of elastic fabric, so disposed as to form a portion of the back  
 " of the waistband, its effect being to produce an elastic nip when  
 " the trouser is buttoned on to the wearer. Various forms of  
 " such inserted elastic fabrics may be used. An india-rubber  
 " fabric is preferred, but springs or other elasticated arrange-  
 " ments may be adopted for a like purpose, so as to give the  
 " waistband a tight hold upon the body, causing a good fit."

[Printed, 2½d.]

A.D. 1853, October 8.—N° 2302.

ARCHER, ALEXANDER EDWARD DUDLEY KNOX.—" Improve-  
 " ments in apparatus for applying metallic capsules." These are,  
 using "a ring of gutta percha or other suitable material for  
 " applying capsules to the necks of bottles or other vessels."  
 " An elipsis " is " the best shape in which the ring may be  
 " formed." This ring is fastened on to a stand ; a cord or band  
 fixed to the stand passes over the elastic ring, and at its other  
 and is fastened to a treddle. "The bottle with a capsule upon

AIR, FIRE, AND WATER PROOFING. 375

“ it is then put into the ring, and a foot or other pressure being applied to the treddle,” pinches the elastic ring, impressing the capsule into the neck of the bottle; the pressure is then removed and the bottle withdrawn.”

[Printed, 6½d.]

A.D. 1853, October 8.—Nº 2307.

WILKINSON, WILLIAM.—“ Improvements in protecting telegraph wires.”—*This invention did not proceed to the Great Seal.*—It is as follows:—“ Take a piece of metal corrugated in the direction of its length, and with two plain or corrugated sides or flaps.” “ Take as many wires as there are corrugations, and coat them with gutta percha, bitumen, or other insulating medium, and place one wire in each trough formed by the longitudinal corrugations in the metal.” “ Then bend down the flaps or sides over the wires, and apply pressure thereon, so that the whole may form a band or belt which, may be readily coiled, and which will form a strong protection to telegraph wires.”

[Printed, 2½d.]

A.D. 1853, October 11.—Nº 2324.

WILKINSON, WILLIAM.—“ Improvements in bands, belts, and straps.”—*This invention is void by reason of notice to proceed not having been given within the time prescribed by the Act.*—It consists as follows:—“ Interposing one or more layers of woven wire cloth produced either in the ordinary wire-weaving machinery or in warp or other machinery capable of weaving wire between flat strips of gutta percha or gutta percha combined with other materials, and then subjecting the same while in a warm state to pressure, so as to cause the gutta-percha surfaces to unite through the interstices of the wire cloth, so as to enclose the wire cloth between them;” “ or employing cement to cause the surfaces to adhere. Instead of wire cloth, also using perforated metal, whether copper, zinc, sheet iron, galvanized or otherwise, &c., or cloth composed wholly of fibrous materials, or partly of wire and partly of fibrous materials.” “ Combine, where necessary, two or more of the said modes of



376 INDIA RUBBER AND GUTTA PERCHA :

“ manufacturing in the same band, belt, or strap, and make the same of any thickness that may be required.”

[Printed, 2½d.]

A.D. 1853, October 11.—N° 2327.

DICK, DAVID.—“Improvements in the manufacture of flexible tubes or pipes.”—*This invention is void by reason of notice to proceed not having been given within the time prescribed by the Act.*—It relates to “the manufacture or production of flexible or elastic tubes or pipes in such manner, that whilst they will be perfectly flexible, they will be of very superior strength, and capable of resisting both internal and external pressures of large amount.” “Such tubes are made by encasing a copper or other metallic coil or helical tube in some elastic gum, as vulcanized india rubber or gutta percha, so that the elastic material is thus strengthened by a powerful vertebral backbone.” “This tubing may be made either by drawing an india-rubber tube over a metallic coil or helical tube, or the elastic gum may be moulded round the metallic coil.” “Two or more concentric metallic coils may be used with elastic gum between the two coils, as well as surrounding the whole tube.”

[Printed, 2½d.]

A.D. 1853, October 11.—N° 2336.

PORTER, JOHN FRANCIS.—“Improvements in the moulding of bricks and other articles of like materials.” It is necessary in most cases to prepare the clay “by passing it through crushing rollers, or by washing it before entering the brick machine, and even before moulding by hand.” “The rollers for crushing are frequently kept close by means of weighted levers, which levers, being very imperfectly elastic, in rising and falling rapidly sometimes fracture with the surge;” to remedy this, “substitute a chamber and piston, to be operated upon by air or by an elastic strap, in order that the load on lever or otherwise shall be to a great degree elastic.” “But as it often happens that such levers are in the way of the persons working about the machine, and in order to cause the machine to occupy as little space as possible,” “introduce an elastic cushion to bear

“ directly on bearing of axle of rollers. Besides allowing the machine to work more quietly, and relieving it from strains through the elevation and depression of dead weights, the rollers will be pressed together with greater force in proportion as the material is in larger pieces.” The elastic strap referred to above is of “india rubber or other elastic material,” and the elastic cushion is a cylinder of “vulcanized india rubber or other material possessing elasticity.” A brick-making machine is described which fills “a mould or moulds with clay or brick earth by means of a pair of rollers which force the clay, and compress it therein.”

[Printed, 11½d.]

A.D. 1853, October 12.—N° 2339.

MORISON, JOHN, and HURN, DANIEL.—“Improvements in the manufacture of nosebags.” These are, first, “the construction of bags, for the purposes above described, woven in one piece with a selvaged opening, so as to give a uniform strength to all parts thereof by obviating the necessity for a seam or seams, and strengthening trimmings.” Second, “the coating of the lower parts of nosebags with gutta percha or other plastic material for the purpose of protecting and waterproofing them.”

[Printed, 5½d.]

A.D. 1853, October 13.—N° 2361.

MEINIG, CHARLES LUDOVIC AUGUSTUS.—“Improvements in galvanic batteries.” In these improvements, of which there are several (see “Abridgments of Specifications of Patents on Electricity, Magnetism,” &c.), one is said to be “the construction of portable galvanic or voltaic batteries, which can be placed in any position without letting out the fluid, by fixing on a slab of gutta percha or other suitable non-conducting and non-absorbent material, pairs consisting of two dissimilar metals in metallic connexion, in such a manner that cells are formed between the pairs adapted to take up a porous non-conducting substance, which will absorb and retain the fluid; the pairs being placed opposite each other, so that the positive metal of one pair stands opposite the negative metal of the next pair in

378 INDIA RUBBER AND GUTTA PERCHA :

" the same cell, but without contact, and that the fluid in one cell does not communicate with the fluid in the other cells."

[Printed, 5½d.]

A.D. 1853, October 13.—N° 2362.

GRAHAME, THOMAS.—"Improvements in building ships and other vessels." These are, first, when iron or other metal is used for plating, substituting thin sheets instead of single sheets of greater thickness. The thin sheets are laid together, and have sheets of cork, gutta percha, india rubber, cloth, paper, or other material between them, employing "a solution of gutta percha or of india rubber or other matter." Second, "in the use or substitution of ribs or framings of trough in the place of the angle or T-iron now in use, in iron, wooden, or other vessels, in the view of obtaining greater strength with diminished weight;" "covering the bottoms of vessels, whether built of wood or iron, with a smooth vitreous substance or smooth enamel of any kind, to reduce the friction in passing over and through the water;" employing "sheets of iron coated with enamel."

[Printed, 2½d.]

A.D. 1853, October 15.—N° 2375.

COATES, CHARLES.—"Improvements in and applicable to looms for weaving;" consisting of, first, "machinery for stopping looms in the absence of the weft, or in case of the shuttle failing to box." The driving pulley, "instead of being on the crank shaft, is on a stud projecting from an elbow lever. A friction pulley on the driving pulley is held in contact with and gives motion to a pulley on the crank shaft as long as the weft crosses the shed; but if the weft fails, the knocking-off lever is liberated in the ordinary manner, thereby causing a spring to act on one arm of the elbow lever; the contact pulleys are thereby disconnected, and the same time a break is brought in contact with the fly-wheel on the crank shaft, thereby instantly stopping the loom." "When the shuttle is caught in the shed, the loom is stopped in the following manner:" "At each end of the reel is a feeling finger fixed to a slender rod; these fingers come in front of the reed, and are pushed back by the shuttle at every pick. A catch projecting from

“ one of the fingers is placed in a line with a catch lever, and  
 “ when the fingers are not pushed back by the shuttle, owing to  
 “ the same being caught in the shed, the catch acts on the catch  
 “ lever, and as this catch lever is connected with the knocking-off  
 “ lever, it is evident that when the shuttle fails to box, the loom  
 “ is stopped, as before described.” “ A recess is formed in the  
 “ end of the lever ” “ containing a piece of vulcanized india  
 “ rubber or other suitable elastic material, and a stud.” “ The  
 “ object of this piece of elastic material is to produce the desired  
 “ pressure between the surfaces of the friction pulley and fly-  
 “ wheel.” The elbow lever has a bar attached to it which is held  
 in its proper position “ by a spring of vulcanized india rubber  
 “ or other suitable material.”

Second, a mode of fixing cops on the shuttle skewer, the spring  
 or other fastener being “ forced against the interior of the cop,  
 “ thereby holding it firm ;” the object being, “ that the spring or  
 “ other fastener of the skewer shall be inactive when the cop is  
 “ put on, and in bringing the spring,” &c. “ into action when the  
 “ skewer, with the top on it, is put into the shuttle.”

[Printed, 8½d.]

A.D. 1853, October 15.—Nº 2376.

THOMAS, FREDERICK SAMSON.—“ Improvements in the con-  
 “ struction of railway carriages.” These consist, first, “ in con-  
 “ structing compressible railway and other carriages for preventing  
 “ the destruction of life and property.” Second, “ in the employ-  
 “ ment of a suspended buffer.” Third, “ in the application to  
 “ railway carriages of axles revolving at their centres.” Fourth,  
 “ in the employment of a girdle in the event of collisions.”  
 Fifth, “ in the employment of a railway tender, the frame of which  
 “ is made of compressible and expansive tubes.” Sixth, “ in the  
 “ employment of a travelling buffer.”

In advance of the locomotive is a carriage called a “ travelling  
 “ buffer ” or “ a shield ;” “ it is composed of springs and elastic  
 “ materials, and is intended to be occupied by a guard ;” “ it is  
 “ capable of compression to one half its length.” “ In the rear of  
 “ the locomotive the tender is placed.” It is very light, “ com-  
 “ posed of tubes sliding within each other, and governed by  
 “ springs so as to produce elasticity.” “ Within the carriage,  
 “ instead of cisterns of iron,” “ the water is in reservoirs or bags

## 380 INDIA RUBBER AND GUTTA PERCHA :

" of india rubber, or some other elastic and waterproof material." The " travelling buffer or shield " " is constructed of sliding " tubes ; " " in part of the buffer, divisions are made by straw " shields or mattresses, " which " extend across the carriage, and " are covered with a thin coat of india rubber to prevent cutting " from the springs. " The girdle of elastic webbing consists of " a waistband, " " applied by buckles, to be connected with which " are straps coming from the back over the shoulders. "

[Printed, 1s. 9½d.]

A.D. 1853, October 15.—N° 2382.

WOODCOCK, THOMAS.—" Improved means of cutting, carving, " engraving, piercing, or embossing metallic or other surfaces. "—*This invention is void by reason of notice to proceed not having been given within the time prescribed by the Act.*—It relates " to " a plan of withdrawing the tool from the work when it is not " intended to operate upon the same. " " This object is effected " by means of a powerful electro-magnet in combination with a " pattern or design, prepared in a peculiar manner, and so arranged " that it will form part of an electric circuit, of which the cutting " tool, the electro-magnet, a galvanic battery, and suitable con- " ducting wires, and also a metal tracing point to trace out the " design on the pattern plate, form part. Certain portions of the " pattern plate, cylinder, or roller are made of metal, or some good " conductor of electricity, and other parts are made of some non- " conducting substance, such as wood, ivory, gutta percha, glass, or " other suitable substance. The metal tracing point, which forms " part of the electric circuit above mentioned, will, in passing over " the various parts of the pattern, make and break the circuit, and, " consequently, alternately magnetise and demagnetize the induced " magnet, which will, therefore, either attract or release the metal " tool. "

[Printed, 2½d.]

A.D. 1853, October 17.—N° 2396.

APPLEGATH, AUGUSTUS.—" Improvements in letter-press " printing machinery. " These are, " arranging or combining " machinery in such manner that three ' forms ' are used, two " ' similar ' forms ' for printing one side, and one ' form ' for " printing the other side ; hence, two impressions are taken by the

“ machine from one of the ‘ forms ’ for each impression taken  
 “ from either of the other ‘ forms.’ For this purpose, the three  
 “ ‘ forms ’ used may either have a reciprocating motion, or they  
 “ may be on cylinders, and have continuous rotary motion. When  
 “ the three ‘ forms ’ are to have a reciprocating motion it is pre-  
 “ ferred that they should be on the same table, the two similar  
 “ ‘ forms ’ being towards the ends of the table, and the third  
 “ ‘ form ’ in the middle. Each of the end ‘ forms ’ passes to and  
 “ fro under a printing cylinder, having suitable tapes and appa-  
 “ ratus for conducting the paper to and from the ‘ form ;’ and the  
 “ third ‘ form ’ is by the same motion of the table caused to pass  
 “ under two printing cylinders, and to give off its impression to  
 “ the paper alternately, which is printed on the other side by one  
 “ of the other two end ‘ forms ;’ the ‘ forms ’ in their to-and-fro  
 “ motion being inked in the ordinary manner. When a continuous  
 “ rotary motion is preferred, the three ‘ forms ’ are fixed on three  
 “ cylinders, two of them having like ‘ forms ’ for printing one  
 “ side of each two sheets of the paper, and the third to print the  
 “ other side of each sheet of paper. The ‘ forms ’ are inked in  
 “ the ordinary manner, and the paper is conducted to and from  
 “ the ‘ forms ’ by tapes and cylinders placed between the cylin-  
 “ ders on which the ‘ forms ’ are fixed.” The inking rollers  
 “ revolve in their carriages, and are drawn into contact with the  
 “ type and distributing surfaces by means of india-rubber springs,”  
 and “ the levers or arms move upon pins, and have upon their  
 “ rollers two sets of endless tapes ” to take away the printed  
 matter. These arms “ are raised by strong india-rubber  
 springs.”

[Printed, 10½d.]

A.D. 1853, October 18.—N<sup>o</sup> 2398.

PRICE, GEORGE.—“ A new or improved method of communi-  
 “ nicating between the guard and driver of a railway train.”—  
*This invention is void by reason of notice to proceed not having been  
 given within the time prescribed by the Act.*—It consists “ of an  
 “ elastic continuous tube of any required length. The tube is  
 “ coiled round a hollow drum, and the drum is enclosed in a case  
 “ fixed in the guard’s van. One end of the tube passes through  
 “ the drum into the axis thereof, which is made hollow for the  
 “ purpose of receiving it, and projects from the axis.” “ The

382 INDIA RUBBER AND GUTTA PERCHA :

“ other end of the tube is passed over looped rollers attached to each carriage and truck, and is fixed to a box on the engine; the box contains a sounding instrument.” “ The box on the engine to which the tube is connected contains a number of metallic vibrators or reed pipes, capable of producing a loud noise when air is forced through them. That end of the tube which passes out at the axle of the drum has a mouth-piece attached to it, and a winch or handle on the said drum enables the guard to wind up the said tube after it has been liberated from the engine.” The tube is made in preference “ of vulcanized caoutchouc, the elasticity of which allows it to expand and contract sufficiently to accommodate the varying length of the train.”

[Printed, 2½d.]

A.D. 1853, October 18.—N° 2404.

RIDER, EMORY (*partly a communication*).—“ Improvements in the manufacture or treatment of gutta percha, being improvements upon the invention secured to him by Letters Patent, dated the 20th day of July 1852.” These are, improvements in the invention contained in the Specification of Patent, N° 14,230 for “treating gutta percha by the action of heat, so as to expel the volatilizable ingredients therefrom, and render the same fit for the processes of vulcanization,” and consist in adding to the raw gutta percha a small quantity of sulphur, or any equivalent of sulphur, before subjecting the gutta percha to the preliminary heating process,” by which means “ a lower temperature produces an effect equal to that of a higher temperature when the gutta percha alone is treated.” “ One part of sulphur or the equivalent thereof, added to eighty parts of gutta percha when separated from its solid impurities, is suitable for effecting this purpose.” “The sulphur or hyposulphite of lead or zinc, or the artificial sulphuret of lead, or other equivalent of sulphur, should be thoroughly mixed or incorporated with the gutta percha by passing the gum and the dryers repeatedly between metallic rollers heated to a temperature sufficient to make the gutta percha very soft, and easily kneaded or worked.” “ The incorporated material having been ground, is then placed in a strong metal vessel or vessels, care being taken, however, that the material does not occupy more than one third of the capa-

“ city of the vessels, so as to leave due allowance for the swelling  
 “ or expansion of the material when under the action of heat.”  
 “ The material is then exposed to a temperature of about two  
 “ hundred and ninety degrees Fahrenheit, for a space of about  
 “ three hours.” “ The gutta percha, having undergone this pre-  
 “ liminary heating, may be employed in manufactures of various  
 “ kinds, as, for belting, shoe soles, coating telegraphic wires, and  
 “ other purposes to which the gum is now usually applied in  
 “ England, the gum in this state being an improvement upon  
 “ that in ordinary use, insomuch that it will not oxydize ; or the  
 “ gum may be prepared for the vulcanizing operation.”

[Printed, 3½d.]

A.D. 1853, October 19.—Nº 2406.

GIDLEY, GUSTAVUS, and MUSCHAMP, JOHN BELL.—“ An  
 “ improvement in making india-rubber solution for waterproofing  
 “ cloths or other articles without the offensive smell produced by  
 “ the used of naptha, turpentine, oils, &c.”—*This invention is  
 void by reason of notice to proceed not having been given within the  
 time prescribed by the Act.*—It is as follows :—“ Procure a vessel  
 “ in the shape of a bell, composed of iron or any other wire inter-  
 “ woven like the meshes of a net ; into this put the quantity of  
 “ rubber required ; then set fire to one of the pieces ; in a short  
 “ time the oil or fatty matter exudes through the holes into a  
 “ receiver placed under. Then take twelve pounds and put it  
 “ into an iron or other vessel, place it over a fire, adding india  
 “ rubber, gutta percha, or any gums required ; after it is dissolved  
 “ add sulphur and common salt or saltpetre, the quantity of  
 “ which will depend upon the nature of the work required.  
 “ Then spread it upon the cloth, and, if required, on both sides,”  
 “ place it upon a table heated, which draws it through,” “ then  
 “ proceed to put on ” “ different colours.”

[Printed, 2½d.]

A.D. 1853, October 21.—Nº 2430.

JOHNSON, JOHN HENRY (*a communication from Jacques  
 Lefevre*).—“ Improvements in the treatment or manufacture of  
 “ gutta percha, and in the applications thereof.”—*This invention  
 is void by reason of notice to proceed not having been given within*



## 384 INDIA RUBBER AND GUTTA PERCHA :

*the time prescribed by the Act.*—“The raw material is cleaned  
 “ and purified by being passed through a mill having indentations  
 “ or teeth formed within a fixed chamber, and similar indentations  
 “ on the surface of a revolving cone working inside this chamber;  
 “ the gutta percha is passed between these toothed surfaces and  
 “ falls on to toothed rollers beneath and between, which it is  
 “ drawn by their revolutions.” “The stringy or tough parts are  
 “ fumigated and rendered white so that it may receive any color  
 “ required.” “For liquifying gutta percha, carburet of hydrogen  
 “ is employed. From the distillation of pit coal an oil is obtained,  
 “ which is well washed and allowed to rest 48 hours on a (“base  
 “ salifiable”) salt base; it is then distilled.” “One application  
 “ of this liquified gutta percha is the construction of printing  
 “ rollers, which are composed of equal parts of glue, treacle, and  
 “ dissolved gutta percha; but these proportions may be varied  
 “ according to the nature of the ink employed.” “Liquid gutta  
 “ percha thus prepared, mixed with gluten, gum lac, and copale,  
 “ makes a varnish which adheres with great affinity to glass or  
 “ metals, preserving the latter from oxidation or from the action  
 “ of acids. For applying the same to wood, a certain amount of  
 “ pitch is added. The gutta percha may be solidified by being  
 “ heated whilst in a soft state, having added to it a solution of  
 “ the gutta percha obtained by the carburet of hydrogen as above  
 “ described, when the mass is passed through rollers to render it  
 “ perfectly homogenous.” “Gutta percha thus prepared may be  
 “ applied to all kinds of objects of art or manufacture.” “The  
 “ carburet above mentioned, with five to seven per cent. of alcohol  
 “ and sulphuric acid added will dissolve all the fatty, gummy,  
 “ and resinous bodies, and will serve to clean various articles,  
 “ such as stuffs, kid gloves, and silks of the most delicate tints.  
 “ It may also be employed for dissolving the gummy portions of  
 “ silk cocoons, and for many similar purposes.”

[Printed, 2½d.]

A.D. 1853, October 21.—N° 2439.

COOK, HENRY, and COOK, AUGUSTUS.—“Improvements in  
 “ the means of communication between guards, engine drivers, or  
 “ passengers in or on railway trains.”—*This invention is void by*  
*reason of notice to proceed not having been given within the time*  
*prescribed by the Act.*—It proposes to use “india-rubber tubing

“ (either coated or partially prepared with gutta percha, or otherwise), providing each vehicle with a proper length thereof, and fitted at each end with the means of securing a safe and powerful junction, and securing a continuous even passage or bore throughout the entire length of the junctions, so that messages may be transmitted without any interior impediment or obstruction. The junction of the ends will be effected by a spring (or other) joint with great rapidity and facility, provision being made for the jerks consequent on railway travelling by traction, or otherwise.” “These at their absolute extremities, or at any part thereof where communication may be required, are to be furnished with a powerful whistle, first to call attention as a whistle, then to be converted by the person for whom the coming message is intended into an ear trumpet or into a mouthpiece.”

[Printed, 2½d.]

A.D. 1853, October 22.—N° 2443.

MERMET, JEAN FRANÇOIS.—“An elastic spring, contained in a cylinder tube or a tubular case, the lid of which moves down and up according to the pression.”—*This invention is void by reason of notice to proceed not having been given within the time prescribed by the Act.*—If the spring is in metal it is a spiral wire, or if it is of “caoutchouc, gutta percha, or any elastic substance it is massive,” and it is covered with an “unyielding material.”

[Printed, 2½d.]

A.D. 1853, October 25.—N° 2459.

BRADY, JOHN DRUMGOOLE.—“An appendage to knapsacks.” This consists “of a supplementary pouch or ammunition case suspended at the inner side of the knapsack from a cross strap attached thereto, or to the slinging straps of the knapsack, in such a position that it may be readily detached by unbuckling its suspending strap without taking off the knapsack, and then placed upon the waistbelt when required for immediate use.” “This supplementary pouch may be made of leather, gutta percha, or other waterproof material, and may be capable of containing twenty rounds of ammunition, or a greater or less

386 INDIA RUBBER AND GUTTA PERCHA:

" quantity as may be required." " In cases where the knapsack  
" is provided with flaps or a pocket at the inner side," " place the  
" supplementary pouch beneath the flaps or pocket, or, where  
" the knapsack is not thus provided, furnish a special flap or  
" pocket for the purpose of protecting the pouch from wet or  
" friction."

[Printed, 5½d.]

A.D. 1853, October 25.—N° 2466.

GOODYEAR, CHARLES.—"Improvements in the manufacture  
" of boots and shoes." These are said to be improvements in  
" a former invention contained in Specification of Patent  
" N° 14,221.

" And in these improvements there are used elastic and flexible  
" treads in the fore parts of the soles of boots and shoes; self-  
" acting valves are also applied to prevent the air under the foot  
" passing, except in the directions desired." "The flexible and  
" elastic parts introduced into the heels and fore parts of the  
" boots or shoes act to propel the air, and at the same time such  
" parts offer elastic treads to the boots and shoes, and cause the  
" soles and heels thereof to wear longer than when simply made  
" of leather or suitable hard substance or material all over."  
" The heel has a central elastic tread, which, in preference, is of  
" vulcanized india rubber. The heel is hollow, and has a tubular  
" valve leading from the fore part of the sole into the hollow of  
" the heel." " In making the elastic and flexible parts for the  
" tread both of the sole and heel, they are made of india rubber  
" vulcanized, the edges or margins being strengthened with fabric  
" before vulcanizing."

[Printed, 6½d.]

A.D. 1853, October 27.—N° 2486.

GEORGE EDWARD.—"Improvements in galvanic  
" These are, first, "the use of acid solutions in con-  
" the negative elements of batteries having any suitable  
" ible, not composed of free mineral acids, applied to  
" elements."

" Application of porous divisions of earthenware or  
" stoneware, or cells, or vessels, wholly or partly

“ constructed of gutta percha or india rubber, or like materials, or compounds containing such materials.”

Third, “ the use of lead as a negative element with any suitable positive element, and any suitable exciting liquid or liquids, in batteries for working electric telegraphs or clocks.”

Fourth, “ the use of iron as a positive element, with any suitable negative element, and any suitable exciting liquid or liquids, in batteries for working electric telegraphs or clocks.”

Fifth, “ the rendering air-tight, by any suitable means, batteries employed for working electric telegraphs;” but the plan preferred consists in “ employing cells or troughs of gutta percha to contain the liquid, and plates and covers of the same material, firmly attached with close joints by the aid of heat and proper cements, as is well understood in manipulating this material.”

[Printed, 34d.]

A.D. 1853, October 31.—Nº 2507.

WRIGHT, JOHN TURNER, WRIGHT, EDWIN PATON, and ASBURY, WILLIAM. — “An improvement or improvements in mill banding.” The object being “to prevent the elongation which is produced in mill banding made of gutta percha, or compounds of gutta percha, by use, as well as to strengthen the said mill banding.” By introducing “into mill banding made of gutta percha, or compounds of gutta percha, metallic wires or cords, or threads made of hemp or other fibrous substance, or catgut, or wires, lines, cords, or threads of any other material having sufficient flexibility, and not liable to permanent elongation by long continued moderate tension.” In applying the wires, cords, threads, or lines to flat mill banding, “take two flat strips or bands of gutta percha, or compound of gutta percha, the combined thickness of the said two strips or bands being about equal to the thickness which it is intended the finished mill banding shall have;” place the “wires, cords, threads, or lines between” the “strips or bands of gutta percha, or compound of gutta percha” (the said wires, cords, threads, or lines being by preference placed parallel to and equi-distant from each other, and parallel to the sides of the bands or strips of gutta percha, or compound of gutta percha); “then apply heat and pressure to the said strips or bands of gutta percha, or compound of gutta percha.” In making “round (or cylindrical)

388 INDIA RUBBER AND GUTTA PERCHA:

" mill banding," " coat or cover each of the said wires, cords, threads, or lines with gutta percha, or compound of gutta percha, by any of the well-known processes of coating or covering wires with gutta percha," and afterwards " combine any required number of the coated wires, lines, threads, or cords together by heat and pressure, so as to produce a cylindrical or other shaped band of gutta percha, or compound of gutta percha."

[Printed, 3½d.]

A.D. 1853, November 2.—N° 2534.

TAYLOR, WILLIAM.—" Stopping of bottles containing aerated liquids."—*This invention is void by reason of notice to proceed not having been given within the time prescribed by the Act.*—It consists of " a stopper of metal, gutta percha, ivory, or wood, or any other hard substance made hollow and plugged or stopped at the end entering the bottle, and perforated with holes about the middle of the cylindrical part of the stopper, so as to allow of the passing of liquids or gases through the perforated holes; which stopper is to be surrounded with an elastic ring made of india rubber or vulcanized india rubber, and which stopper, when passed into the bottle, is, with the ring of india rubber, held in its place by a collar of metal surrounding the neck of the bottle, and having two projecting arms with clamps, so made as to admit of a proper degree of motion for the elevation or depression of the stopper for the admission of the liquids and gases, or for drawing them off, which drawing off or filling is effected by the rolling motion given to the india-rubber ring. By depressing the stopper the ring is rolled over above the perforated holes in the stopper, and by elevating it the ring is rolled so as to be below the holes, thus effectually securing the liquids and gases."

[Printed, 2½d.]

A.D. 1853, November 2.—N° 2545.

HODGES, RICHARD EDWARD.—" An improvement in fastening the ends of springs made of india rubber." This consists of " employing a tube or ring or orifice of very small diameter compared with the diameter of the solid or hollow spring of vulcanized

" india rubber, the end of which is required to be held; and in  
 " order to pass the end of the spring through the small passage  
 " in which it is to be held the india rubber is extended till its  
 " diameter is small enough for the holder to pass on, and then,  
 " when the india rubber on being released contracts in length  
 " and expands in diameter, it will be tightly held in the small  
 " passage, and the holding may be made more secure by turning  
 " the end of the spring, if it be tubular, over the end of the  
 " holder, or by having a filling piece introduced into the hollow  
 " end, and when the spring is solid the holding may be increased  
 " by a cap or instrument pressing on its outer end."

[Printed, 5½d.]

A.D. 1853, November 4.—N° 2563.

**RACSTER, WILLIAM.**—"Improvements in the construction and  
 " arrangement of the buffing apparatus of railway carriages, and  
 " the mode of applying the buffer and draw springs to such car-  
 " riages;" the object being "to so construct and arrange the  
 " several parts that the buffer rods may extend back beyond the  
 " centre of the carriage, and also when several carriages are  
 " coupled together that the buffing apparatus may, when sub-  
 " mitted to a given amount of pressure, form one continuous  
 " frame throughout the whole train, so that when a blow is given  
 " to any of the buffers the shock will be distributed throughout  
 " the continuous buffer frame without injuriously affecting the  
 " carriages in which the passengers may be sitting." "The buffer  
 " rods are arranged in pairs, and extend back considerably beyond  
 " the centre of the carriage." "The ends of one pair of rods are  
 " made to slide in slots or sockets made in or attached to the pair  
 " at the other end of the carriage, and vulcanized india-rubber or  
 " coiled metallic springs are adapted to the ends of one of the  
 " pair, in order to neutralize the effects of sudden concussion," &c.

[Printed, 9½d.]

A.D. 1853, November 8.—N° 2592.

**PARRATT, GEORGE FREDERICK.**—"Improvements in life rafts."  
 This consists of a "combination of air-tight flexible vessels, made  
 " by preference of vulcanized india-rubber, combined with spars  
 " and netting, or like open work or fabric, the flexible vessels

“ being strengthened with canvass and netting.” “ For this purpose four or more flexible air and water tight tubular vessels are used (generally four), and they are combined together end to end in such manner that they will form a lozenge-shaped outline of hollow tubes; and they are kept extended to the greatest length by spars fixed thereto; and when out of use the tubular sides will pack close up to the central or longitudinal spars, but when in use a transverse spar or spars holds the two sides of the raft to the greatest breadth.” “ The whole area enclosed by the tubular outline is covered with netting or open work or fabric, so as to offer holding surfaces for persons, and yet be open for the free passage of water.”

[Printed, 5½d.]

A.D. 1853, November 10.—N<sup>o</sup> 2602.

PIDDING, WILLIAM.—“ Improvements in the manufacture of fabrics made of silk, cotton, wool, flax, hemp, straw, grasses, fibres, mohair and other hair, spun glass, and enamelled, glazed or plain wire, and in the application of some of those materials, and also in the machinery or apparatus connected with such manufacture.”—*This invention did not proceed to the Great Seal*—It consists in causing “the raised looped pile made as described

A.D. 1853, November 10.—N° 2606.

**FONTAINEMOREAU, PETER ARMAND LE COMTE DE** (*a communication*). — “Improvements in preventing accidents on “railways; also in shifting and lifting railway carriages.”—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists, first, “for enabling the “driver of a train to change the line of rail.”

Second, “for communicating along the train.”

Third, “for superseding turn-tables.”

Fourth, “for moving and lifting railway carriages.”

In communicating along the train “an india-rubber pipe” is employed “terminated at each of its extremities by a speaking “trumpet.” The india-rubber tube is attached to a fixed brass joint “by means of cords tied round a neck formed for that purpose.” A moveable joint is fastened to the fixed one.

[Printed, 1s. 9½d.]

A.D. 1853, November 11.—N° 2610.

**BANNER, EDWARD GREGSON.**—“Improvements in saddlery “and harness.” These are, first, in collars. Second, the application of vulcanized india rubber to reins and bridles. Third, the application of an elastic apparatus (a small cord of vulcanized india rubber) to suspend the bit to the upper jaw. Fourth, the spring eye or hook fastenings; and last, the metallic holder. For “the comfort of animals drawing vehicles,” “making the collar “on which the traces are attached by hames elastic, making that “part of the collar where the hames are fitted in the usual “manner;” but “making that part resting upon the shoulders or “withers of the horse or other animal, of india rubber, waterproof “cavass, or any other elastic or semi-elastic material, and inflating “it with air.” “Attaching one end of a piece of vulcanized india “rubber to that portion of the bit loop into which the snaffle “rein is usually buckled, the other end being secured to a ring.”

[Printed 5½d.]

A.D. 1853, November 11.—N° 2611.

**WALKER, HENRY.**—“Improvements in means of communication from one part of a railway train to another.”—This inven-



*tion did not proceed to the Great Seal.*—"Each carriage is to be provided with one piece of tubing (by preference gutta-percha tubing) of suitable length, and each end thereof is to project sufficiently to provide for half the coupling. These ends are to be joined when in use by an union or other joint, which will connect or disconnect readily." "For the guard's van, or other carriage, where it is desired to fix for signaling, a T-joint should be made from the tubing which runs under the van or carriage, and a branch taken from it into or outside of the van, any convenient height, fitting it with a mouthpiece for blowing or speaking or hearing, with a moveable whistle, which is always to remain in the tubing when removed to blow therein, or for listening, &c." "If metal tubes are used, either in part or altogether, they will require a piece of elastic tubing or lining in the inside thereof, but as all operations of this kind in metal are expensive in construction and doubtful in result," "the elastic or semi-elastic vegetable tubing" is preferred.

[Printed 2½d.]

A.D. 1853, November 11.—N° 2619.

DICKSON, JAMES HILL.—"Improvements in the process of preparing flax or similar fibrous material, and rendering it fit for spinning and weaving." These are, first "releasing the fibres of the flax, hemp, and other plants from the green coloring or adhesive matter." Long flax being the most valuable the green fibre is "bound by india-rubber bands in lots of about as much as a man can grasp in his hand." These lots are placed in drawers with a grate like bottom, and let into vats containing a liquid composed of one gallon of cow's urine to every six gallons of water, and steam turned on, and motion given to the drawers; after a given time the liquid is run off, and fresh water is supplied, and the contents of the drawers are passed through a wringing machine on an endless band." Second, "discharging the gummy or glutinous matter" by hot water and soap, the flax still bound as before in the india-rubber bands." Third, the contents of the drawers "are passed through the wringing machine," &c.

[Printed 7½d.]

A.D. 1853, November 12.—N<sup>o</sup> 2627.

AUSTIN, WILLIAM.—“Improvements in the manufacture of “casks.” These are “with a view to their stowing or packing “with less loss of space” by “forming them each with six equal “sides, so that, when on end several casks may be placed together without space between them.” In order to facilitate their rolling from place to place without friction or strain on the cask, each cask is furnished “with temporary elastic hoops of vulcanized india rubber.”

[Printed 6½d.]

A. D. 1853, November 15.—N<sup>o</sup> 2648.

FRY, JOSEPH.—“Improvements in preparing solvents for india-rubber and gutta percha, and in rendering waterproof fabrics “free from odour.” These are, first, “distilling the solvents of “india rubber and gutta percha with those matters present or “combined therewith,” “introduce india rubber or gutta percha “with the solvent into a still, and then distil over the solvent;” “four to six ounces of india rubber or gutta percha (according to “the state of impurity of the solvent) dissolved in each gallon is “sufficient for the purpose.” “The solvents usually employed “for such purposes are turpentine and coal naphtha, or coal oil, “and either of these may be taken in the crude state, and have “dissolved therein india rubber or gutta percha, and then “distilled; or the crude solvent may be distilled, first, without “india rubber or gutta percha being present, and afterwards be “combined with india rubber or gutta percha, and again distilled “or rectified.” “Removing the odour of articles fabricated of “india rubber or gutta percha, in which solvents have been “used,” “by submitting them to the free action of steam on all “parts of the surfaces, preferring that the steam chest or chamber “should be of iron, and it is desirable also to line the whole interior “with flannel, dry at the commencement of the process.”

[Printed 2½d.]

A.D. 1853, November 18.—N<sup>o</sup> 2682.

POOLE, MOSES (*a communication*). “Improvements in surface condensers, and in evaporators and heaters for steam “engines.” One of these improvements consists in a “method

## 394 INDIA RUBBER AND GUTTA PERCHA:

“ of securing the tubes of a tubular condenser,” in such manner “ that the tubes are free to expand and contract, and can easily “ be withdrawn and replaced.” This is effected by “ a supplementary elastic tube sheet, made of vulcanized india rubber or “ gutta percha, or their equivalents,” as follows :—“ bore the “ holes in the usual metallic tube sheet a little larger in diameter “ than the outside of the tubes,” next “ place the tubes through “ both tube sheets, with their ends projecting a short distance “ beyond each of them.” “ Then procure a sheet of vulcanized “ rubber, and pierce it with holes, smaller in diameter than the “ outside of the tubes, and equal in number and corresponding “ in position to the holes in the metallic sheet.” “ When two “ such sheets are finished enter each tube in its appropriate holes “ in the elastic sheet, and force said sheet down over the tubes, “ until it rest against the metallic tube sheet. The india rubber “ will then form a very short cylinder around each tube, hugging “ it closeley, and preventing any fluid from passing between the “ india rubber and the tube.” “ The elastic sheet ” may be divided “ into as many pieces, as convenience may dictate, so long “ as the edges of each sheet are suitably held down.”

[Printed 8½d.]

A.D. 1853, November 21.—Nº 2703.

SIBBALD, ROBERT JAMIESON.—“ An improved mode of communicating from vessels to the shore, or from one vessel to “ another.” Using “ a light buoyant float or buoy, formed by an “ inflated bag or balloon, made of any water or air proof material or “ materials, to which is attached a cord, and which cord or line is “ wound round the float, or upon a reel attached thereto, or “ placed upon or within the float, so that the coil of cord is carried “ by the float in such a way that when the apparatus is cast into “ the sea, and one end of the coil is held on board the vessel, it “ will unwind or ‘pay out,’ as the float is blown to leeward by “ the wind ; by this arrangement the float has not to drag the “ rope after it in its progress, but merely to uncoil it.” In preference, the floats are made of a spherical or oval shape, of india rubber, gutta percha, “ and kept distended,” in one direction by means of ribs or rings, so that when not inflated they will lay flat and be *portable*. And that they may be readily inflated, a hollow staff or *standard* is passed through a valve placed at one end of the

bag, and into a socket fixed on the inner side of the reverse end, so that when the apparatus is required to be inflated, all that is requisite is to force out the bag by means of the staff until it is fully distended, then close the valve. "Pockets or small depôts are constructed in or upon the floats, into which letters or other small articles can be placed and conveyed therein."

[Printed 5½d.]

A.D. 1853, November 24.—Nº 2732.

CHALMERS, DAVID.—"Improvements in railway breaks and signals."—*This invention did not proceed to the Great Seal.*—The first part relates to breaks of railways, the second to "communicating signals between the guard and engine driver, or from one part of the train to another," as follows:—"Fix along the top of each carriage a tube made of india rubber or metal, or partly metal and partly india rubber or other flexible material; before the train starts, connect these tubes by a single socket joint, which, as soon as inserted, is tightened by means of a lever and catch which hold it air tight; thus forming a continuous and perfect speaking tube, by which the guard can communicate with the engine driver, and vice versâ, in oral language, which must be the most perfect and safest of all signals."

[Printed, 5½d.]

A.D. 1853, November 25.—Nº 2746.

DREW, ALEXANDER.—"Improvements in ornamenting woven fabrics and other surfaces."—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It relates "to the preparation of sheet material to be used in the subsequent ornamentation of woven fabrics, such as ladies dresses and other surfaces, on the general system of relief ornamentation, for which Letters Patent for England were granted to Mr. Thomas Auchterlonie, of Glasgow, in the year 1850." "Such sheet material is composed of a thin sheet or film of gutta percha or other adhesive substance, on which is laid down a thin sheet of gold leaf, the two materials being attached together to form a solid sheet or layer, by mechanical pressure and heat." Sheets so prepared answer as the raw

396 INDIA RUBBER AND GUTTA PERCHA :

“ material, whence the required devices or figures are cut out  
 “ for attachment to the fabric or surface to be ornamented by  
 “ mechanical pressure and heat.” “ Leaf metal of various kinds  
 “ may be thus used, and instead of applying the metal in the  
 “ leaf state, bronze, or other powder may be brushed on or applied  
 “ to the surface of the adhesive sheet.” Or “ the metal covered  
 “ sheets may be coated for a similar purpose by the electro-  
 “ deposit process ; various obvious modifications being available  
 “ for producing the required metallised fabric or material pre-  
 “ paratory to its being attached in the form of ornamental devices  
 “ to the body fabric.”

[Printed 24d.]

A.D. 1853, November 30.—N° 2784.

DAVIS, EDWARD KEATING. — “Improvements in machinery  
 “ for making pipes, sheets, still works, and other articles from that  
 “ class of metals called soft metals, as lead, tin, zinc, bismuth,  
 “ or alloys of soft metals that are capable of being forced out of  
 “ metal receivers or chambers, through dies, cores, &c.” These  
 are first, “ the double-action hydraulic press.” Second “ the  
 “ casing of soft metal pipes with block and other metals.” Third,  
 “ the forcing of soft metals by compressed air, without regard to  
 “ form of dies and cores.” Fourth, “ the plating of sheets, in  
 “ the manner described.” Fifth, “ the mode of making soft  
 “ metal sheets, as set forth.” Sixth, “ the improvement in metal  
 “ charging apertures.” Seventh, “ making dies for coating lead  
 “ and other pipes with other metals.” Eighth, “ making metal  
 “ container and the press cylinder, as described.” Ninth, “ the  
 “ mode of making still worms as described.” Tenth, “ the coat-  
 “ ing of soft metal pipes with gutta percha, india rubber, &c.”  
 The interior or exterior, or both, are coated with “ gutta percha, or  
 “ caoutchouc, either in the combined or simple state, and also  
 “ combined with other materials in gums, lacs, bituminous, and  
 “ resinous matters ; the same to be used in a state of solution,”  
 “ preferring in all cases,” “ after there has been a prepare by coat-  
 “ ing” “ applied, to deposit lastly, a coating of pure gutta percha.”

[Printed 1s. 4d.]

A.D. 1853, December 1 —N° 2798.

JOHNSON, JOHN HENRY (*a communication from Charles  
 Eugène François Guibal and Louis Philippe Bernard Edouard*

*Cumenge*).—"Improvements in the treatment or manufacture of "caoutchouc." This invention relates "to a system or mode of "preventing the waste by evaporation of the volatile ingredients "employed for dissolving the caoutchouc, preparatory to, or in "the course of its manufacture, and consists in traversing webs "of cloth containing layers of soft caoutchouc through closed "chambers, having a refrigerating top and a heated bottom "over which the cloth is traversed." "The heat produces the "evaporation required, and the vapour, on coming in contact "with the cold top of the chamber, is condensed, and runs into "suitable gutters, whence it pours into a main trough or other "receptacle."

[Printed, 5½d.]

A.D. 1853, December 1.—N° 2799.

JOHNSON, JOHN HENRY (*a communication from Charles Eugène François Guibal*).—"Certain applications of vulcanized india "rubber." These applications are to "curry combs, brushes of "all kinds, and artificial cloth." The caoutchouc is mixed with "a composition of sulphur and oxyde of zinc, and formed into a "sheet, which is then moulded by suitable moulds into the form "required, being heated by steam stoves or other means." "In "manufacturing curry combs, the india rubber is moulded on "one side into a rough surface, and the other side left plain for "the attachment of a stiff and ridged handle or back, which is "fitted with a strap to secure it to the hand." "In making "tooth and other brushes, the bristles or hairs are replaced by "the employment of a series of tufts of india rubber formed "like bristles." "These tufts are inserted into the foundation or "back of the brush when in the mould, such back being com- "posed also of india rubber, and attached to any suitable holder." "The cloth composed of this material may be made either single "or double, that is, with one or two faces. In the manufacture "of single cloth, a cotton, wool, or silk fabric is employed, which "is thinly coated with india rubber, incorporated with any "material conducive to its eventual vulcanization. The layer is "then rendered adhesive by heating, and a nap of any kind of "color desired is laid on to its surface, the adhesion to which is "afterwards rendered complete by pressure." "The same pro- "cess is simply repeated for double-faced cloth;" "in addition

398 INDIA RUBBER AND GUTTA PERCHA:

" to the vulcanizing mixture, coloring powders are employed."  
" The dark colors are black ; carbonate of lead may be employed ;  
" and for the lighter tints, oxide of zinc is used. For reds, blues,  
" &c., vermillion, ultramarine, &c. may be employed."

[Printed, 5½d.]

A.D. 1853, December 2.—N° 2804.

**BROWN, ALEXANDER.**—"Improvements in metallic casks and  
" other vessels." These are, first, "the general arrangement and  
" construction of metallic casks and other vessels."

Second, "the system or mode of constructing metallic casks  
" and other vessels in separate halves, formed with flanges, for  
" the purpose of bolting or joining them together, and with a lip  
" or ring flange projecting beyond the flange of one of the halves  
" and fitting within the other half."

Third, the application and use in metallic casks constructed as  
described, "of a ring of india rubber or other elastic material as a  
packing for the joint of the cask."

Fourth, "the system or mode of applying a packing ring of  
" india rubber or other elastic material to the covers of casks and  
" other vessels."

[Printed, 5½d.]

A.D. 1853, December 8.—N° 2853.

**BEALL, JAMES.**—"Improvements in apparatus for applying sand  
" to the rails of railways." This invention has for its object "the  
" construction of apparatus to be applied to locomotive or other  
" carriages, in order to apply sand, when desired, to the surfaces  
" of the rails of a railway." For this purpose "the sand is placed  
" in a suitable vessel, the shape of which may be varied, and from  
" this vessel a tube descends to near the surface of the rail on  
" which sand is to be laid ; and in order to regulate the supply of  
" sand to the rail a valve is employed at or near the upper part of  
" the tube, which when down closes the openings into the tube."  
" The valve may be varied in its form ;" the one preferred con-  
" sists of a flat valve, coated with vulcanized india rubber, which  
" comes on to a ring or edge surrounding the entrance into the  
" tube," the valve being constantly pulled on by an india rubber  
" or other spring, or in place of such form of valve, as above  
" described, the valve may consist of a hollow cup, which, when

“ closed, covers the opening into the tube.” “ The valve is in  
 “ connexion with a suitable pull or instrument for opening it  
 “ and keeping it open against the action of the vulcanized india-  
 “ rubber spring.”

[Printed, 5½d.]

A.D. 1853, December 8.—N<sup>o</sup> 2854.

NEWTON, WILLIAM EDWARD (*a communication*).—“ Improved  
 “ machinery for drilling or boring rocks and other hard sub-  
 “ stances,” consisting of “ the arrangement (in a swinging or other  
 “ frame)” “ of two crossheads, the one with a reciprocating  
 “ motion, and the other (which is connected therewith, and carries  
 “ the drill,) having a reciprocating and progressively advancing  
 “ motion communicated thereto.” “ The employment of a sliding  
 “ rod for the purpose of changing the rate of rotation and the  
 “ rate of advance of the drill by one movement,” using “ the  
 “ sliding rod for either of the purposes above named separately.”  
 “ In rock-drilling machines, the use and mode of applying”  
 inclined planes, “ whether used for the purpose of advancing the  
 “ drill and for rotating the same, or for either purpose separately.”  
 “ Making the ratchet cylinder, or equivalent rotating arrangement,  
 “ to slide upon the mandril or drill stock as the same advances, in  
 “ such manner that the pawle holder projection or fork may  
 “ retain its place in the inclined groove or on the bar.” Also the  
 “ application of india rubber or other elastic material, either alone  
 “ or in combination with other substances, as a spring to effect  
 “ percussion, with drills for boring rocks or hard substances, and  
 “ this whether it be used with cams, or whether the recession be  
 “ effected in other ways.”

[Printed, 10½d.]

A.D. 1853, December 9.—N<sup>o</sup> 2862.

SHANKS, ANDREW.—“ Improvements in instruments and appa-  
 ratus for indicating or measuring weights and pressures.” These  
 are “ the application of flattened flexible bulbs or discs, made of  
 “ any suitable material, having mercury, alcohol, or any other  
 “ fluid intervening, which fluid is forced up a vertical or horizontal  
 “ or spiral glass column attached so as to indicate the pressure or  
 “ dynamometric force.” The flattened bulb or reservoir is in a  
 chamber of brass work, the upper portion of which “ has a packing



400 INDIA RUBBER AND GUTTA PERCHA:

“ made of india rubber or other suitable material for the purpose  
“ of making it air, steam, or water tight;” a pipe leads from the  
bottom of the chamber attached to the boiler, &c. Other appli-  
cations of this principle are described.

[Printed, 7½d.]

A.D. 1853, December 10.—N° 2878.

COATES, CHARLES. —“ Improvements in and applicable to  
“ looms for weaving.” These are, first, the application of a break  
to the lay or batten of looms, but “ particularly applicable to  
“ looms driven by friction pulleys,” as described in the Specifica-  
tion of Patent N° 2375, 1853, “ for the purpose of checking the  
“ momentum of the same.”

Second, “ the application of a buffer for stopping the lay or  
“ batten.” The buffer is contained in a box, which box is  
“ secured to the lay bottom, and contains a piece of vulcanized  
“ india rubber or other suitable elastic material, against which  
“ the inner end of the buffer bears.”

Third, “ the application of vulcanized india rubber or other  
“ elastic material to the check bands or straps, against which the  
“ pickers act.”

Fourth, “ the improved mode of driving looms by fixing a  
“ friction pulley on the tappet shaft.”

Fifth, “ the chamber round the guide spindle of the picker to  
“ contain lubricating material.”

Sixth, “ the application of vulcanized india rubber or other  
“ suitable elastic material to that part of pickers which acts  
“ against the shuttle.”

[Printed, 8½d.]

A.D. 1853, December 13.—N° 2888.

REDGRAVE, WILLIAM. —“ The improved safety travelling cap ”  
consists of “ one, two, or three, or any number, at the option of  
“ the wearer, of air-tight circular tubes to be inflated when  
“ required for use, or contrariwise when not wanted, and to be  
“ made of any materials, as silks, satins, velvets, alpacas, woollen  
“ cloths, &c., or in fact of any material that is manufactured or  
“ known, and can be made into any shape; it combines both  
“ safety, ease and comfort to the wearer.”

[Printed, 2½d.]

A.D. 1853, December 13.—N° 2890

WANSBROUGH, JAMES.—“Improvements in the manufacture of waterproof fabrics;” these consist, “in giving to waterproof fabrics an artificial face or finish different from that of the fabric itself, so as to resemble woollen cloth or such other fibrous materials as are capable of being worked into flock.” And a peculiar feature in this invention is, “the saturating of the cloth with a solution of india rubber or gutta percha, either separately or in combination after the flock has been placed thereon, and then passing the fabric between pressure rollers;” the substance or consistence of the india-rubber or gutta-percha solution employed, will depend “upon the nature and substance of the material to be waterproofed; for example, if the material is thin, the solution must also be thin, and vice versa.”

[Printed, 2½d.]

A.D. 1853, December 13.—N° 2894.

GUESDRON, ANDRÉ GASPARD.—“A method of producing plans in relievo.”—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—“These plans are formed of two sheets of caoutchouc or other analogous material rendered adhesive at the edges only, with here and there parts or points covered with silk, stuff, or other similar material, to represent objects in relief.” “The objects required are made to appear in relief by blowing in air between the sheets of caoutchouc, the edges of which must then be hermetically closed.”

[Printed, 2½d.]

A.D. 1853, December 16.—N° 2933.

GOODYEAR, CHARLES (*partly a communication*).—“Improvements in the treatment and manufacture of india rubber.” These are, “combining vulcanized or changed india rubber with raw or unvulcanized ” “india rubber.” “The old or waste vulcanized or changed india rubber is first reduced to a finely divided state before it is mixed and combined with india rubber which has not been vulcanized.” “This reduction may be done in any convenient manner;” but it is preferred to employ “a paper engine for the purpose, and to treat the india rubber

402 INDIA RUBBER AND GUTTA PERCHA:

" therein in like manner to that in which rags and other matters  
" are reduced to pulp." " If the vulcanized india rubber consists  
" of pieces of sheets, they may be at once introduced into the  
" engine with water, and reduced to a fine state of division. If  
" the vulcanized or changed india rubber is in lumps or blocks,"  
then " reduce them by cutting them into slices." " When the  
" vulcanized india rubber has been reduced to as fine a state of  
" division as may be," " mix the same with raw india rubber by  
" masticating them together." " The combined product of india  
" rubber and vulcanized india rubber " obtained " is then to have  
" mixed with it as much sulphur (or matters which will give off  
" products of sulphur on applying heat,) as would be used for  
" vulcanizing the quantity of raw or fresh india rubber that is  
" contained in the combined mass, and the compound is then in  
" a state suitable to be rolled into sheets or made up into articles,  
" and subjected to the process of heat."

[Printed, 2½d.]

A.D. 1853, December 16.—Nº 2936.

WAITHMAN, ROBERT WILLIAM.—" Improvements in belts or  
" bands for driving machinery for use in mines and for other  
" purposes." These are, first, the use of tubes woven or otherwise  
for the above purposes.

Second, using " certain substances and compounds for coating  
" and cementing " these tubes, and also " for coating the exteriors  
" of bands woven solid, of linen or other fibrous materials, and of  
" the width required for use, such bands being applied for the  
" before-mentioned purposes." These substances, &c., are as  
follows :—" No. 1, a composition, of which inspissated or partially  
" inspissated gas tar forms a part. No. 2, a composition, formed  
" of india rubber and ground peat or bark. No. 3, gutta percha  
" or caoutchouc dissolved in gas tar."

[Printed, 2½d.]

A.D. 1853, December 17.—Nº 2937.

BAILEY, JOSEPH SHARP.—" Improvements in machinery for  
" operating upon wool, alpaca, mohair, and other fibrous materials  
" preparatory and prior to being spun." These are, first, " em-  
" ploying what are known as porcupine rollers, on which the  
" teeth are mounted in rows parallel to the axes of the rollers,

“ with intervals of space between such rows, in which spaces are placed strips or pieces of india rubber or other elastic material, or of leather, gutta percha, or other flexible material, provided with springs or other means to give them an elastic action.” The flexible or elastic material “operating to strip or remove the fibrous material from the teeth of such rollers.”

Second, “the adaptation, application, use, and employment to and with travelling chain combs, and also to and with gill combs, of auxiliary holding combs.” These are small tail levers, connected by india rubber or other suitable springs to the brackets upon the gills, or to the gills themselves; these springs are to effect by their tension a constant tendency to elevate the auxiliary holding combs.” Likewise adapting, applying, and using “to and with travelling chain combs, chain combs, and likewise to and with gill combs, of working combs operating upon the fibrous materials, upon or carried by such travelling chain combs or by such gill combs.” In this last arrangement a spring “of india rubber or other suitable material is mounted conveniently, so as to effect by its elastic action and tension a tendency to depress the arm” of a lever carrying a working comb. This spring is intended to keep “the working comb so depressed, when such working comb is not elevated or raised by the passing of the travelling comb beneath the inclined or cam surface of the lever.”

Third, “discharging the fibrous materials from the lower races or rows of teeth of gill apparatus, instead of from the upper race or row as usual.”

Fourth, “discharging the fibrous materials from gill apparatus, or to a comb or combs placed between the upper and the lower races or rows of teeth.”

Fifth, “removing and transferring the fibrous materials from the working comb to another comb, or back to such working comb subsequently to being worked, and previous to being drawn into sliver.”

Sixth, “the employment of additional rollers in combination with ordinary drawing rollers for drawing fibrous materials from combs into slivers.”

Seventh, “the employment of rotary comb carriers or comb holders, carrying combs mounted on revolving machines for filling and transferring fibrous materials.”

[Printed, 1s. 8½d.]

404 INDIA RUBBER AND GUTTA PERCHA:

A.D. 1853, December 17.—N<sup>o</sup> 2939.

ANDERSON, GEORGE.—“Improvements in apparatus used  
“when manufacturing gas, which apparatus or part of which  
“is also applicable when transmitting gas from one place to  
“another.” This invention consists “in the employment of a  
“single cylinder or chamber, with a piston moving therein at a  
“comparatively high velocity, say, equal to that of a steam  
“engine; the cylinder or chamber being what is called double-  
“acting, that is, having an inlet and outlet valve or sets of  
“valves at each end thereof.” These valves, in preference, are  
“arranged close to the ends of the cylinder or chamber, and to  
“be self-acting, or acting alone by the vacuum created or the  
“pressure exerted.” “These valves, in order to their being  
“light, and easily acted upon,” in preference, are formed “of  
“leather or gutta percha or other suitable flexible material which  
“will not to any great extent, be acted upon injuriously by the  
“gas.” A regulator, which is described, affords means by which  
“the supply of gas to the exhauster may be uniform.”

[Printed, 10½d.]

A.D. 1853, December 17.—N<sup>o</sup> 2940.

BEDELLS, CALEB.—“Improvements in the manufacture of  
“elastic fabrics.” These are “manufacturing elastic fabrics by  
“winding silk or other yarn or thread on to a cylinder or surface,  
“so as to cover the same.” “The yarns or threads thus wound  
“or laid side by side, have a coating of cement applied thereto; a  
“thin sheet of vulcanized or changed india rubber is to be coated  
“with india-rubber cement, and the surface thereof brought in  
“contact with the cylinder or surface on which the yarn or thread  
“is wound or laid, by which the whole or a part of the yarn will  
“be combined with vulcanized or changed india rubber.” “If  
“only part of the surface is so combined with india rubber, the  
“other part may be turned over and cemented to the other  
“surface of the vulcanized or changed india rubber, or the  
“other side of the india rubber may be covered with other color  
“of the material, or a different material may be used for the  
“two sides of the fabric;” “and in some cases enclose “longi-  
“tudinal strands of braided or covered vulcanized india rubber  
“within the fabrics produced as above stated.”

[Printed, 10½d.]

A.D. 1853, December 17.—N° 2942.

GREENWOOD, JOHN.—“Improvements in preventing drafts of air into rooms and places when the doors and windows are shut.” These are applying “strips of vulcanized india rubber either to doors or windows, or to the parts against which doors or windows come in contact with, and the application is such that the strips are fixed at one of their edges; so as to allow of the other of their edges protruding, and to extend to such an extent beyond the surfaces in which they are fixed that the protruding edges may come in contact with the shutting surfaces or against the surfaces shut against, and be thereby pressed on so as to exclude drafts of air.”

[Printed, 5½d.]

A.D. 1853, December 17.—N° 2943.

JAMES, ISAAC.—“Improvements in carts for distributing water or liquid manure.” These are first, “forming such distributor with a lid, to enable the inside of the distributor to be readily cleansed.” “The door thereof” is formed of zinc or other suitable metal about one quarter of an inch thick, hinged and furnished with a bar, and thumb screws “for closing the lid, and rendering it water-tight;” and “if necessary a washer of vulcanized india rubber or other suitable elastic material may be placed between the lid and the distributor, so as to surround the opening thereon, and in this manner to render the same readily water-tight, and by thus constructing the distributor it will appear evident that it can be readily cleansed, and the holes thereby prevented from clogging.”

Second, “the combination of two or more sieves for straining the liquid as it passes into the body of the cart.”

Third, “the use and application or employment of hoop iron covered with brown paper and white lead,” for connecting together the boards which compose the body of the cart.”

[Printed, 6½d.]

A.D. 1853, December 21.—N° 2966.

BOCCIUS, GOTTLIEB.—“Certain apparatus adapted to the breeding and rearing of fish.” The apparatus consists “of a vessel, receiver, tub, or box, made with apertures sufficiently

406 INDIA RUBBER AND GUTTA PERCHA:

“ small on the top and bottom to prevent fish, eggs, or spawn  
 “ escaping through, yet sufficiently large to allow water to per-  
 “ colate into the apparatus when immersed in water.” “The  
 “ apparatus is made with a lid or cover, or in two or more sections  
 “ or parts, one part fitting into or on the other.” “In the interior  
 “ place a tray or receiver, or a series of them, one upon the other,  
 “ all perforated, as before described, on which fish eggs of the  
 “ salmonidae tribe may be deposited; other fish eggs require no  
 “ tray, receiver, or division in the apparatus,” but “substitute for  
 “ the trays moss or weed, or other suitable material sufficient to  
 “ entangle the fish eggs or spawn, and preserve them in their  
 “ position when immersed in water.” “The apparatus may be  
 “ made of any buoyant material, such as gutta percha, in order  
 “ to float upon the surface of the water.”

[Printed, 4½d.]

A.D. 1853, December 24.—Nº 2987.

COLES, RICHARD GEORGE.—“Improvements in the locks of  
 “ fire-arms.”—*This invention received provisional protection, but*  
*notice to proceed with the application for Letters Patent was not*  
*given within the time prescribed by the Act.*—It consists “in the  
 “ use and employment of vulcanized india rubber or other suitable  
 “ elastic material for the main, and if necessary other springs, used  
 “ in the locks of fire-arms generally, as a substitute for the steel  
 “ springs hitherto employed.”

[Printed, 2½d.]

A.D. 1853, December 24.—Nº 2993.

LEWIS, JOSEPH.—“Improvements in apparatus for drilling or  
 “ boring metals and other substances.” These improvements  
 relate, first, “to hand-drilling apparatus, in which the feed is re-  
 “ gulated by a screw nut, to be governed as to its rotation by  
 “ the workman;” and consists “in the adaptation to the said nut  
 “ of suitable mechanical apparatus for holding it by friction, the  
 “ amount thereof being capable of adjustment, so as to regulate  
 “ the feed.”

Second, “refers to that description of drill for which Letters  
 “ Patent were granted to Francis Alton Calvert, dated December  
 “ Twenty-eighth, One thousand eight hundred and fifty-two;”

and consists "in the application of india rubber placed within the sockets which contain the driving ratchets, for the purpose of forcing them forward, instead of the metallic springs now employed for that purpose."

[Printed, 54d.]

A.D. 1853, December 28.—N° 3002.

PARKINSON, JOHN.—"Improvements in governors for regulating the pressure of steam, gas, and other fluids or liquids." These are, first, "the application of a double compensating valve, acted upon by a flexible diaphragm, or other equivalent agent for regulating the pressure of gas and certain other fluids or liquids." It is preferred "to make the diaphragm of vulcanized or mineralized india rubber or other elastic materials, or thin metal may be used." "The pressure on the diaphragm can be regulated by weights." "When no gas is allowed to escape through the burners, both valves are in contact with their seatings; but as soon as the gas passes through the burners," the pressure is diminished; "the weight on the diaphragm" lowers the compensating valves off their seatings, "and the gas passes through the openings."

Second, a "combination of parts for regulating the pressure of steam and certain other fluids or liquids, consisting of a double compensating valve and flexible diaphragm, the latter being protected from the action of the steam or other fluid or liquid, the pressure of which is to be regulated by a column of water or other liquid."

[Printed, 54d.]

A.D. 1853, December 28.—N° 3010.

PARKER, FRANCIS.—"An improvement in the manufacture of gaiters." This consists of "manufacturing them in such manner as to make them elastic, so that being made complete and not open at the sides, they may be extended and passed over the feet; and then, by reason of introduced india rubber, the gaiters will contract and fit correctly to the upper part of the feet and ancles." "For this purpose, two fabrics, or it may be leather, are cemented together by india-rubber cement, there being parallel strands of vulcanized india rubber (held in an ex-



408 INDIA RUBBER AND GUTTA PERCHA :

“ tended state) introduced between such two fabrics or leather till  
 “ the cement is dry, when, on releasing the strands of vulcanized  
 “ india rubber, the fabrics or leather will pucker up.” “ From  
 “ such fabrics or leather proper forms for a gaiter are cut, and  
 “ they are joined at the back and front; the strands of vulcanized  
 “ india rubber running, by preference, in a horizontal or nearly  
 “ horizontal position in the gaiter.”

[Printed, 5½d.]

A.D. 1853, December 29.—Nº 3014.

JACKSON, HENRY.—“ Improvements in machinery for mould-  
 “ ing bricks and other articles of brick earth.” This invention  
 consists of a combination of machinery for the above purpose, which  
 works as follows :—“ the brick earth is delivered from pug mills or  
 “ other preparing machinery on to an incline, and it is then  
 “ pressed forward by rollers with inclines or blades which move  
 “ forward the brick earth on to a series of endless straps of gutta  
 “ percha or other suitable material, such straps carrying forward  
 “ the brick earth in divided sheets between guides.” “ On the  
 “ sheets of brick earth arriving over a table or platform cutting  
 “ moulds descend, and each mould cuts out a quantity of brick  
 “ earth suitable for a brick or other articles depending on the  
 “ form of the mould, and by reason of each mould having a piston  
 “ or plunger therein, pressed down by a spring or springs tending  
 “ to force out the plunger or piston, the brick earth is pressed  
 “ in the mould, and when the mould rises the reaction of the  
 “ spring or springs forces out the moulded and pressed articles.”  
 “ Endless straps carry away the moulded bricks or articles, and  
 “ a fresh quantity of brick earth comes under the moulds, which  
 “ again descend and cut through the brick earth. In order to  
 “ ensure the delivery of the bricks or articles, a box or vessel  
 “ with perforated bottom is employed to dust sand over the brick  
 “ earth just before it comes to the moulds.” “ The bricks or  
 “ articles thus moulded are taken by hand from the several  
 “ endless straps.”

[Printed, 1s. 1½d.]

A.D. 1853, December 29.—Nº 3021.

VION, HIPPOLYTE CHARLES.—“ Improvements in pistons and  
 “ stuffing boxes of engines moved by water, steam, or gas.”—

*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists “in substituting for the springs, “ screws, cones, &c.” “for tightening,” “the resilient action of “ water, ether, or any other suitable liquid, or of any compressed “ and liquified gas whatever.” In carrying out this invention a piston rod is described with a bottom and upper flange ; between these flanges is fixed a collar of vulcanized india rubber round the piston rod, and a covering of the same material is fixed round the outer part of the flange, so as to form an “angular space containing the liquid that has to act as a spring. A valve whose stem projects into the angular space, and “which is held down by “ a helical spring” “kept tight by an india rubber washer,” serves to regulate the pressure of the liquid upon the collars or rings of vulcanized india rubber. In case metallic rings are preferred, the outer ring of india rubber may be replaced by a “brass ring which rubs against the cylinder, and an interior “ ring of lead which transmits the pressure of the liquid.”

[Printed, 4d.]

A.D. 1853, December 30.—N<sup>o</sup> 3028.

MABON, WALTER.—“Improvements in machines used for “ rivetting together metallic plates.” These are, first, arranging the mechanism of such machines, “so that short lengths of metal “ may be used as cut from the bar, the machinery making both “ heads of the rivets at the same time when placed in the holes “ which perforate the plates.” This may be accomplished “by “ two levers arranged and connected so as to bring two rams “ from and towards each other.” The two levers may be actuated “ from the piston rod of one steam cylinder, or instead of steam, “ hydraulic power may be employed, or the levers may be actuated “ by or from a cam or cams placed upon a shaft revolved by “ suitable gear ;” “between the two piston-like plates,” buffers “ of india rubber or other powerful spring are placed, and the “ plates are bolted together and screwed up till the elastic force “ of the spring will be equal to the pressure required at that “ point to give that pressure required on the plates or on the “ rivets.”

Second, “in combining with the first arrangement, mechanism “ for putting a pressure upon the plates to keep them firmly

## 410 INDIA RUBBER AND GUTTA PERCHA:

“ together while the heads of the rivets are formed.” “ This,”  
 “ may be accomplished by additions to and modifications of the  
 “ first arrangement, that is, a second steam cylinder may be em-  
 “ ployed to actuate a hollow ram or moveable piece, by which  
 “ the pressure is put on the plates to hold them firmly together.  
 “ In this case, one of the levers, working the ram to form one  
 “ head of the rivets, has its fulcrum upon the hollow ram or  
 “ moveable piece through which its ram passes; or, instead of  
 “ using a second steam cylinder, a ram may be fitted on one of  
 “ the rivetting rams moveable upon it, and kept in advance of  
 “ the rivet die by a powerful spring, (which may be constructed  
 “ on the buffer principle, so that it will come in contact with  
 “ the plates, and press them together before the rivet die begins  
 “ to form the head; or otherwise the ram may be actuated by a  
 “ separate cam, a spring being arranged as before mentioned, or  
 “ the mechanism rendered flexible so as to put on the required  
 “ pressure. In machines arranged herein referred to, and in ma-  
 “ chines of ordinary construction, which only form one head to  
 “ the rivet, and are actuated by gearing, it will be advantageous  
 “ to arrange a flexibility in the mechanism actuating the ram  
 “ (a powerful spring or springs), which will give way after a  
 “ certain pressure is put on, and thus accommodate the motion of  
 “ the ram to a variable length of rivet.” The spring is india  
 rubber.

[Printed, 10½d.]

A.D. 1853, December 31.—N° 3031.

PHYSICK, HENRY VERNON.—“ Improvements in electric tele-  
 “ graphs and apparatus connected therewith.” These improve-  
 “ ments are said to be eight in number (see “ Abridgments of  
 “ Specifications on Electricity, Magnetism, &c.”); one is “ the use  
 “ of a material which lessens the amount of noise consequent on  
 “ working an instrument.” The material is a “ packing of gutta  
 “ percha, leather, cloth, india rubber, or other suitable substance  
 “ to deaden the sound that is caused by the beating of the arms ”  
 “ against the stops,” “ such packing being between the stop, and  
 “ a metallic spring ” “ having contact with it.”

[Printed 5½d.]

A.D. 1853, December 31.—N° 3036.

WAYGOOD, RICHARD.—“Improvements in portable forges.”—*This invention is void by reason of the patentee having neglected to file a specification in pursuance of the conditions of the Letters Patent.*—It is so to construct and arrange the various parts of a “forge,” “that when taken apart they may be packed in a much smaller space than is usually required, so that the forge may be more conveniently transported from place to place than when constructed in the ordinary manner.” “Instead of making the sides of the bellows of leather as heretofore, use india-rubber cloth for this purpose, as this material possesses the property of being uninjured by wet, and is not liable to be damaged by rats, white ants, and other vermin or insects aboard ship, and in warm climates, and is of easy repair; leather may, however, be occasionally employed under some circumstances. The forge pan or trough consists of a rectangular, round, or oval shallow pan or chamber with a cover.” “The bellows are made as near the size and shape of the pan as to fit the interior thereof.” “The weights necessary for raising the handle and pressing the wind are placed inside the bellows instead of outside as before.” “The twyer or tue iron is adapted to one end of the forge, and is divided into two parts, so that it may more easily be slidden into its place, and may not be inconvenient to pack by projecting above the pan,” &c.

[Printed, 2½d.]

A.D. 1853, December 31.—N° 3045.

SOREL, STANISLAUS TRANQUILE MODESTE.—“Certain improved compositions, to be employed as substitutes for caoutchouc, gutta percha, and certain fatty bodies.” The principal bases of the composition are the following substances,—“colophony, or common resin; bitumen, or natural pitch, or the pitch obtained from gas works; fixed resin oils; gutta percha; hydrated lime and water;” “natural or vulcanized caoutchouc;” “pipe clay, or other like argillaceous earths;” “soft or hard alkaline soap,” “bees'-wax.” Various compositions are made by mixing more or less of these substances together, and in different proportions, according to the result required. A soap used for waterproofing is composed as follows:—“60 parts of

412 INDIA RUBBER AND GUTTA PERCHA :

“ water, 6 of soft or hard alkaline soap, 2 of bees'-wax, and 1 of  
“ stearic acid, and to these may be added a small quantity of  
“ pitch and resin,” not more than the composition can dissolve.  
The composition is spread by preference as follows :—“ Stretching  
“ the stuff on a table by means of two cylinders diametrically  
“ opposite, and spreading the gummy agent (previously cut  
“ into the form of small sticks) by means of a hollow metal  
“ scraper heated by means of vapour or hot water.”

[Printed, 3½d.]

---

1854.

A.D. 1854, January 3.—N° 8.

CORLETT, HENRY LEE.—“Improvements in caoutchouc  
“ springs for locomotive engines and tenders, railway carriages  
“ and waggons.” These are, first, “in the form and manner in  
“ which the caoutchouc is applied for buffing, bearing, and draw  
“ springs,” as follows:—“Perforating with a number of holes  
“ or cells of any form or shape a cylinder or other convenient form  
“ of vulcanized or otherwise elastically prepared caoutchouc in the  
“ direction of the spring's action.” “When the range of stroke  
“ is to be considerable, “form the spring of a number of these  
“ cellular cylinders, introducing between each a disc of caoutchouc  
“ of a denser and less elastic description than that composing the  
“ cellular cylinders; or these intermediate discs may be formed of  
“ any fibrous material spun or woven together, gutta percha  
“ cast or wrought iron, or wood, or any suitable material.”  
Second, “in the form of the metal casings or boxes, in which,  
“ when used as buffing and draw springs, the caoutchouc springs,  
“ as above described, will be generally enclosed, though, when  
“ preferred, these casings may be dispensed with without impair-  
“ ing the effect of the springs.” “These casings consist of two  
“ principal parts, a cylinder and piston or plunger of cast iron,  
“ together with the back plate on which the spring impinges, the  
“ cylinder having an internal projection, and the piston or  
“ plunger a corresponding external projection on the end next the

“ spring, which, when the piston or plunger is inserted from the back of the cylinder, and the cylinder being bolted in its place, renders it impossible for the piston to drop out.”

[Printed, 1s. 1d.]

A.D. 1854, January 3.—N° 13.

WILLSON, EDWARD JOHN.—“An improved method of making portfolios, music books, brief cases, and pocket books.”—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists as follows:—“After the covers are prepared, several elastic bands, composed of silk, cotton, and india rubber, are inserted about an inch from the outer edge on the outside of the cover, by which means the back is made to expand or compress; and as regards the inside, a flap made of bookbinders’ cloth or leather is so fixed as to form a back when drawn out or expanded, and thus assists in preventing its contents from falling out.” “The opening is also secured by elastic bands or silk ties.”

[Printed, 3d.]

A.D. 1854, January 5.—N° 23.

WHITE, DAVID BLAIR.—“Improvements in the manufacture of waterproof fabrics, and of waterproof bags and other articles.” These are as follows:—“Two pounds of common dark resin of commerce is dissolved in five gallons coal tar oil,” and “one pound eight ounces of pitch” solution, and “four ounces of india-rubber” solution is in some instances added thereto. Steep the canvas or material in this for about five days; take it out, and while damp rub into it oxide or oxichloride of lead, or lime, or both; when dry “repeat the operations,” only using a stronger solution, say “five pounds of resin to five gallons of oil.” In the manufacture of the bags, in addition to the above, it is preferred to give them a “coating of a mixture of pitch and india-rubber solution.” They may also be covered with canvas saturated with tar oil, the interior washed with “chloride of lime or other soluble chloride,” and in some instances lined “with thin sheet gutta percha, as manufactured by the Gutta Percha Company.”

[Printed, 4d.]

414 INDIA RUBBER AND GUTTA PERCHA:

A.D. 1854, January 4.—N° 32.

RADCLIFFE, JOHN.—“Certain improvements in power looms for weaving.”—*This invention did not proceed to the Great Seal.*—It consists “in the application, employment, or use of elastic surfaces in certain parts of power looms, for the purpose of adjusting, regulating, and softening the impulsive force or action of the ‘picker,’ in lieu of the ‘check strap,’ or other contrivance hitherto employed. Such elastic surfaces may be made of small pieces, or rings, or washers, and placed upon either or both ends of the guide spindle of the ‘picker,’ or they may be attached to both sides of the ears and foot also of the ‘picker’ itself, and thus form an elastic exterior for the same.” “These elastic media act as small ‘buffers,’ and may be adjusted in thickness or strength, and may be composed of caoutchouc, india rubber, or other similar elastic substance, or other suitable contrivance.”

[Printed, 3*ds*.]

A.D. 1854, January 7.—N° 43.

TAYLOR, JOHN GEORGE.—“Improvements in writing apparatus.”—*This invention did not proceed to the Great Seal.*—It relates first to an “arrangement of ever-pointed pencil, or adjustable writing or marking instrument.” “The main shell or barrel of the instrument is of tubular metal, and has an external spiral groove formed upon it.” “The tube is slit through longitudinally for the passage of the propeller, which has only one prominence upon it, and this prominence is quite covered up by the external screw traverser, which has an internal ring groove formed in it to receive and cover up the prominence.” “The holding point of the barrel screws off, or is removeable at pleasure, for the deposit in the barrel of the leads or writing substances.” Second, an inkstand or holder “is arranged with an elastic cover piece of india-rubber, or similar material, contrived to completely cover up the ink.” “Through the centre of this elastic diaphragm a small aperture is made for the entrance of the pen in passing down to the ink, and as this aperture fits to and embraces the pen, the latter is always kept clean and free from superfluous ink.” “And to give this elastic cover a better effect, it is made in two or more layers set

“ one upon the other, and each slitted through at right angles to  
 “ one another, so that the pen is more closely embraced.”

[Printed, 3d.]

A.D. 1854, January 9.—N<sup>o</sup> 50.

HOWSON, RICHARD.—“ Certain improvements in screw pro-  
 “ pellers.”—*This invention received provisional protection, but*  
*notice to proceed with the application for Letters Patent was not*  
*given within the time prescribed by the Act.*—It consists first,  
 “ in shaping the blade in such a manner that the part nearest  
 “ the boss may pass with greater ease through the water;” the  
 manner of doing this is described. Second, “in an improved  
 “ mode of feathering the blades of propellers.” This consists  
 “ in constructing the propeller with a number of loose sections,”  
 “ each section being furnished with as many arms or ribs as  
 “ there are blades; across the bearing sides of these arms is  
 “ extended an elastic substance, such as vulcanized india rubber  
 “ or elastic woven fabric, and they are then opened out after the  
 “ manner of a fan, and screwed or cottared firmly together to  
 “ the required pitch.” “In cases where there are means of  
 “ readily unshipping the screw, a number of sections can be  
 “ stowed away on board, and, when desired, a new screw can be  
 “ quickly rigged out by merely putting two or more sections  
 “ together at the required angle, and stretching across the arms  
 “ strips of a flexible substance, such as gutta percha, buffalo hide,  
 “ or stout canvass,” &c.

[Printed, 6d.]

A.D. 1854, January 11.—N<sup>o</sup> 63.

WATSON, JOSEPH JOHN WILLIAM.—“ Improvements in sig-  
 “ nalling.” These are first, “the application of the electric light  
 “ to signalling.” Second, “the construction and use of the  
 “ apparatus for signalling with the electric light.” Third, “the  
 “ code of signals both for night and day, in connexion with the  
 “ apparatus.” Fourth, “the arrangement of coloured glasses  
 “ and reflectors with the electric or other light.” Fifth, “the  
 “ arrangement of screens or bundles of coloured complementary  
 “ glasses.” Sixth, “the arrangement of permanent and false  
 “ electro-magnets, so that by motion imparted to them by rota-  
 “ tion of the axles of railway carriages an electric current may



“ be generated, and afterwards used to form an electro-magnetic apparatus, which may form a means of communication between guard and driver, by ringing an electric alarm bell or bells in the break vans, and sounding the whistle on the engine, or causing a small van to rotate in a conspicuous position to the driver.” In carrying out this last improvement, “ every carriage is provided with two rods ” of copper well insulated in their roofs, “ and with which, connection is made from carriage to carriage by stout wire rope encased in caoutchouc or vulcanized india rubber.”

See “Abridgments of Specifications upon Electricity, Magnetism,” &c.

[Printed, 7d.]

A.D. 1854, January 11.—N<sup>o</sup> 72.

TUSSAUD, FELIX.—“ An universal pump press, with continuous action, called ‘continuous producer.’ ” “ This pump consists of a screw, or helix or worm, placed inside a cylinder or cone, which fits easily on the circumference of the screw, and of one or more chains or endless racks, or a wheel or wheels with moveable teeth gearing into the thread or threads, whatever may be the form or dimensions of these threads. This screw being set in motion by any motive power, causes this chain or these chains, or else the wheel or wheels, to move in either one or the other direction, i.e., backwards or forwards.” “ This mechanical combination may be used as may be desired, either as a continuous press, or as a force pump, or as a suction pump, or else as a double-acting pump. The endless chain or chains, or the wheel, or else, if required, wheels, after having traversed the cylinder in the longitudinal direction, come out through the bottom by an aperture or by apertures, in which they act like pistons as it were. Hence it is obvious, that each portion of a chain or wheel in the cylinder forms as many pistons as there are circumvolutions or turns of the screw thread round its spindle.” “ These endless chains may be made up of links in the same manner as plate chains, or in any other suitable way,” and they “ may be made of metal, or of any other suitable substance such as india rubber, gutta percha, or any soft or elastic material, according to the uses which this mechanism is put to.”

[Printed, 7d.]

A.D. 1854, January 13.—N° 87.

**EASSIE, WILLIAM.**—"Improvements in trucks used on railways."—*This invention did not proceed to the Great Seal.*—It consists in improving "the pole used for the purpose of connecting trucks used on railways for the carriage of timber, &c.," "by providing such poles with springs of india-rubber or other suitable elastic material, so that the force of the shock occasioned by sudden starting or stoppage of the train or otherwise may be prevented from injuriously affecting the said poles, and so save in wear and tear of material, and increase the security of the load, while also maintaining a condition of elasticity in the relative parts of the mass (load and trucks), and tending to preserve the original fixity of the load and entirety of the connecting pole, which is liable to breakage on strain or shock while not protected with the elastic springs aforesaid."

[Printed, 3d.]

A.D. 1854, January 14.—N° 93.

**BIRD, JAMES.**—"An improvement in taps and cocks."—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists "in providing a slightly yielding seat for the plug of taps and cocks to work in, whereby the grinding of the plug in their seats will be avoided." "After the aperture for the reception of the plug has been cast, drilled, or otherwise formed," "fit to the sides thereof a packing of leather, caoutchouc, gutta percha, or other slightly-yielding material, which forms the bearing or seat for the plug."

[Printed, 3d.]

A.D. 1854, January 16.—N° 99.

**GRANT, PHILLIP.**—"An improved roller used in the processes of letter-press, copper-plate, and lithographic printing."—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It is as follows:—"Instead of the composition hitherto used for making these rollers, consisting of glue, treacle, or molasses, and other similar substances, covering the roller with caoutchouc, commonly called india rubber or some

## 418 INDIA RUBBER AND GUTTA PERCHA:

similar elastic material, "by the application of which the roller is  
"made more durable, and, consequently, economize the expence  
"of it."

[Printed, 3d.]

A.D. 1854, January 18.—N° 125.

BOURQUIN, JEAN PIERRE.—"Improvements in or applicable  
"to troughs or vessels for holding liquid substances required in  
"the art of photography."—*This invention received provisional  
protection, but notice to proceed with the application for Letters  
Patent was not given within the time prescribed by the Act.*—It  
consists, first, "in making the troughs or vessels of a square,  
"rectangular, or other conveniently-shaped framework of wood,  
"in which a glass bottom is cemented in any suitable manner by  
"means of a cement which is not liable to be acted upon by the  
"chemical solutions to be employed." The levelling the trough,  
tray, or other vessel consists in "adapting to the framework of  
"the trough, tray, or vessel, three or more levelling screws which  
"pass through screwed shoulders or brackets fixed on the tray,  
"trough, or vessel, and form the feet whereon the vessel rests."  
"The upper end of these screws is provided with a milled head or  
"other contrivance, whereby the screws may be turned for the  
"purpose of raising or depressing any particular part of the  
"trough, tray, or vessel." "This method of levelling troughs or  
"trays may be adapted to vessels made of any suitable substance,  
"such as gutta percha, porcelain, or glass;" but employing  
"trays made in the manner already explained," is preferred.

[Printed, 3d.]

A.D. 1854, January 19.—N° 135.

RICKARD, CHARLES WILLIAM ROWLEY.—"Improvements in  
"cocks and taps." These are as follows:—"Where clack valves  
"are used," causing "the axis of the valve to form part of the  
"valve, and to enter a recess made for it at the upper part of  
"the valve. It is formed to receive the end of a screw in such  
"manner that, by the screw rotating, the valve is caused to rise  
"or fall. The valve is either ground to its seat, or it is faced  
"with leather, vulcanized india rubber, or other suitable mate-  
"rial, or the seat is coated with such materials. In ballcocks the  
"valve moves through a cupped leather or flexible material, and

" the barrel of the cock comes at right angles to the valve, or, so  
 " that the pressure of the water will be against the side of the  
 " valve, the spout or outlet being below the valve."

[Printed, 6d.]

A.D. 1854, January 21.—N<sup>o</sup> 148.

GRACE, GEORGE, and JONES, THOMAS FRANCIS.—" Improve-  
 " ments in boots and shoes, as also boot and shoe socks or inner  
 " soles, whereby the same are rendered waterproof." These are,  
 first, " rendering of boots and shoes waterproof around where the  
 " sole and upper leather are united," by applying between them  
 " any suitable waterproof material," secured " by being sewed or  
 " otherwise united at the time that the welt and upper leather, or  
 " upper leather and sole, are put together." The waterproof mate-  
 rial is " sheet india rubber, vulcanized or otherwise;" or, as a  
 substitute for this, " a suitable woven fabric or webbing rendered  
 " waterproof by india rubber," &c., " or thin gutta percha may  
 " be substituted."

Second, applying and using " an inner sole or sock being move-  
 " able or fixed, and slightly raised around the edge without any  
 " regard to the manner in which such inner sole or sock may be  
 " made." The sole or socks may be made " by uniting two thin  
 " veneers of cork together by means of a solution made of gutta  
 " percha or india rubber, or a thin piece of cork may be united to  
 " a corresponding piece of thin gutta percha, the cork being the  
 " part to come next the foot; and again, the gutta percha may  
 " be substituted by sheet india rubber, and the cork may also be  
 " substituted by the application of chamois or other leather, or  
 " felt, or woollen cloth may be used, thus ensuring warmth as  
 " well as repelling moisture."

[Printed, 3d.]

A.D. 1854, January 21.—N<sup>o</sup> 155.

EDWARDS, CHARLES JOHN.—" Improvements in the manu-  
 " facture of bands for driving machinery." These are, " in  
 " folding or doubling the bands of leather, so as to bring the  
 " edges of the band into the centre of the back part of the band,  
 " and inside the band placing a long slip or length of strong  
 " leather or ship's canvass prepared with some suitable elastic

420 INDIA RUBBER AND GUTTA PERCHA:

"cement. The edges of the leather having been brought together at the back of the band, they are sewn firmly down by passing the stitches through the two thicknesses of the band, a coating of cement being placed inside the band previously. A strip of leather or canvass may also be placed inside, and the stitches are made to pass through the three thicknesses to the opposite side," &c. "The round bands for grooved pulleys are made of a long strip or strips of leather, which, when turned up edge to edge, form a kind of tube within which a cord or rope or round band of leather or other suitable substance, and properly prepared with an elastic cement, is placed." "A cement composed as follows" is "suitable for the purpose" (*viz.*):— "Two parts by weight of gutta percha, one part of pitch, six parts of spirits of turpentine. These materials are melted together in a water bath, and should be used while warm."

[Printed, 6*d.*]

A.D. 1854, January 23.—No 160.

ROBINSON, THOMAS.—"Improvements in apparatus for filtering volatile liquids." These are as follows:—A funnel is connected to a filtering vessel "by an air-tight joint, by preference of vulcanized india rubber." The filter paper is placed in the funnel, the liquid to be filtered is introduced, and a cover fits on to the funnel; to this cover is attached a flexible tube, which communicates with the upper part of the filtering vessel, thus opening a communication between it and the funnel above the liquid. "The liquid is drawn off by a cock or tap."

[Printed, 5*d.*]

A.D. 1854, January 23.—No 171.

BROOMAN, RICHARD ARCHIBALD (*a communication*).—"Improvements in machinery for sawing stone and marble." These are, in "giving the feed lift to the saw frame at or sufficiently near the centre of the reciprocating motion or stroke, or at equidistant points from the centre, for the purpose of effecting the freer percolation or introduction of sand or other gritty material and water;" in "repeating the feed lift of the saw blades by means of two or more double inclined plates or projections, or their equivalents, at each stroke;" in "interposing

“ india rubber or other elastic medium between the iron ways and  
 “ the double inclined planes or projections which lift the saw  
 “ frame to absorb or reduce the effects of concussion;” in “ giving  
 “ a proportionate feed by means of adjustable friction palls in  
 “ connexion with an adjustable excentric;” and in “ guiding the  
 “ saw frame by means of eccentric pins for the purpose of pre-  
 “ venting lateral motion in the same, without injuring the guide  
 “ posts.”

[Printed, 1s. 1d.]

A.D. 1854, January 27.—N<sup>o</sup> 204.

**TENDALL, HENRY, and TROTTER, WILLIAM ST. CLAIR.**—  
 “ Improvements in machinery and apparatus for crushing,  
 “ washing, and amalgamating auriferous quartz and other ores.”  
 These are, the “ arrangements of machinery for crushing, washing,  
 “ and amalgamating ” with the “ use of a crushing body of the  
 “ form and shape and in the manner shown.” The form of the  
 crushing body preferred is that of a cone: a pin in the bottom of  
 the vessel in which the cone is moved fits loosely into the base of  
 the cone. At the top of the cone is a pin passing through a slot  
 in a wheel rotating by an arrangement of other wheels. “ The  
 “ slot is made large enough to allow the pin to traverse to and  
 “ fro therein.” “ At the inner end of the slot is a piece of  
 “ vulcanized india rubber secured by a wedge.” “ The object  
 “ of this arrangement is, to allow the cone to roll over any  
 “ large pieces or other substance that may get beneath it;” the  
 “ pin traversing freely in the slot of the wheel admits of this  
 “ freedom of motion, the india rubber bestowing the effect of a  
 “ sudden jerk.”

[Printed, 8d.]

A.D. 1854, January 27.—N<sup>o</sup> 205.

**THURLBY, THOMAS.**—“ Improvements in the means of effecting  
 “ instant communication between distant points of railway  
 “ trains.” These are as follows:—“ The several carriages of a  
 “ train ” are fitted “ with suitable pipes placed under the frames,  
 “ or in other convenient part.” “ These pipes are fitted at either  
 “ end with couplings, and connected by flexible pipes,” which are  
 united when a train is made up. “ These pipes are of strong

422 INDIA RUBBER AND GUTTA PERCHA:

“vulcanized india rubber, and hang loose below the draw links and chains;” “place a whistle or other instrument whereby sound is produced at the point to which the signal is to be conveyed, and in connexion with the tube before mentioned.” “At the other end of the train” “place the apparatus whereby the signal is produced, or it may occupy an intermediate position in the train.” For this purpose “employ an air pump, whereby air is condensed in a chamber or reservoir.” “Connect this reservoir with the tube of communication, which is fitted with suitable stopcocks to permit or suspend the emission of air at pleasure.” “The air chamber is always kept charged with condensed air in readiness for use; it is therefore simply necessary that the guard or other person in charge should open the communication between the reservoir and the main tube, when an instantaneous audible signal will be produced by the whistle at the opposite end.” “A code of conventional signals may be arranged by making the sounds of more or less duration, or by the combination of long or short durations of sound.”

[Printed, 1s. 1d.]

A.D. 1854, January 28.—N<sup>o</sup> 211.

RAYMOND, MEAD TERRY.—“Improvements in apparatus for retarding and stopping trains of carriages on railways.”—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists in putting on “the breaks of the carriages by the elasticity of the apparatus immediately on the locomotive being stopped, whether by accident or otherwise,” by interposing “a carriage between the locomotive engine and the train of carriages, in order to carry breaks and apparatus acting by elasticity, in such manner that the breaks will ordinarily be applied to the wheels when the train is at rest, and the breaks will only be removed when the locomotive engine has moved a determined distance in advance of the train, so that should the locomotive, after being in motion be stopped,” “the apparatus, acting by elasticity, will cause the breaks of the interposed carriage to be put on or brought into action, and retard the progress of the train, and bring it to rest, or nearly so, before it comes up to the locomotive engine; the

“ropes, chains, or bands by which the interposed carriage is connected to the locomotive engine, will at the same time be wound or taken up by the apparatus acting by elasticity, as the interposed carriage comes up to the locomotive engine.” “For these purposes, bands of vulcanized india rubber or metallic springs, either separately or combined, are used, both for putting on the breaks and for winding or taking up the bands, cords, or chains which connect the train with the locomotive engine.”

[Printed, 3d.]

A.D. 1854, January 31.—N° 230.

COX, THOMAS.—“An improvement or improvements in buttons, and in attaching the same to articles of dress.”—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists in the “use of gutta percha for making the shank or attachment of buttons, and attaching the said button by the said shank or attachment.” In place of the shank of covered buttons “connect a rod or cylinder of gutta percha to the button, the said rod or cylinder being half an inch long, or thereabouts. An eyelet-hole or other hole is made in that part of the article of dress where the button is to be attached, and the gutta-percha cylinder or shank of the button is passed through the said eyelet-hole;” that portion of the “gutta percha shank which projects through the article of dress is then warmed until it is sufficiently soft to be easily moulded.” “It is then pressed by the finger or otherwise, so as to flatten it into a head, which, when cool, firmly secures the button to the garment.” “The same may be applied to every description of button.”

[Printed, 3d.]

A.D. 1854, January 31.—N° 233.

HOLLINGSWORTH, THOMAS.—“Improvements in forming or applying tags to laces.” These consist in “forming tags on laces, by the use of gutta percha or such like plastic material”; and for this purpose “the ends of laces are first coated with dissolved or softened gutta percha, or such like plastic material, and then formed or moulded into tags.”

[Printed, 3d.]



424 INDIA RUBBER AND GUTTA PERCHA:

A.D. 1854, January 31.—N° 235.

**ERCKMANN, CAROLINE.** — “The manufacture of telegraphic “wires.”—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists in substituting “for gutta percha used at present for the isolation of electric wires from one another, glass, paper, cardboard, or wood and bone.” “The employment of these substances will isolate the wires better than gutta percha. It is, however, still necessary “to cover the assemblage of wires with a coat of gutta percha, tar, or other similar substances.” “To preserve subterranean electric wires from the attacks of insects, such as ants, &c.,” “incorporate in the matter used to form the exterior coat, resinous and bitter substances, or others of a poisonous nature,” or “protect them with a metallic covering.”

[Printed, 3d.]

A.D. 1854, January 31.—N° 241.

**MEEUS, PIERRE JOSEPH.** — “Improvements in producing “metallic surfaces.” These are “gilding and coating with metals, by means of heat and pressure, articles composed of or coated with gums, gutta percha, caoutchouc, or mixtures or combinations of the same, or substances analogous thereto.” Also gilding and coating with metals “on any other solid article “made of wood, metal, plaster, clay, glass, marble, slate, &c.” This is effected as follows:—Cover the article to be gilded or coated “with a film of gutta percha;” place the article “in a stove of such a temperature as to render the gutta percha adhesive or otherwise.” “Soften the film by placing the article “to be gilt before a fire, or before radiating metallic plates.” “In order to gild stationary bodies of large size, such as sculptural ornaments, statues, domes, parts of buildings, &c., “it is first requisite to dry completely the portions to be gilded; “the application of the gutta percha having been effected, the heat radiating from a hot plate or other source is directed on “to each part successively, and the metallic leaf or powder is “applied at the same time on to the film rendered adhesive by heat,” &c. This process is applicable “to the gilding of any elastic or flexible fabric or body,” and “of making imitations “of gold embroidery,” the modes of doing which are described.

[Printed, 4d.]

A.D. 1854, February 1.—N° 247.

WICKENS, HENRY.—“Improvements in the mode of inter-communication on railway trains.” These consist in an arrangement of tubes, gutta percha preferred, “carried along the carriages of a railway train.” One tube, “the main tube, should be suspended by woollen bands,” “or imbedded in sawdust, powdered charcoal, or other suitable material.” The ends of this tube between the carriages should have “suitable connecting joints, such as double bayonet joints, union joints;” “and there should be a joint in the main tube at the end of each carriage, and also at the joints of india rubber tubing, or of other tubing, sufficiently flexible to permit that part of the tube which extends from the carriage to the connecting joint to fall down or bend conveniently when the tube is disconnected at the joints, and also for elongation if required by the motion of the carriages.” “Or the parts of the main tube between the carriages may be of metal or other hard suitable material, with or without a lining of gutta percha, made to form a telescope sliding joint for connexion and disconnection with a screw or spring fastening, and with or without flexible connexions next to the carriages and the joints, as above mentioned.” “The ends of the main tube and of the tubes in the carriages should be furnished with suitable mouth-pieces; and there should also be a whistle or other convenient instrument at each end of the main tube.”

[Printed, 4d.]

A.D. 1854, February 1.—N° 253.

ROBINSON, ALBERT. — “Improvements in preparing compositions for coating iron and other ships’ bottoms and other surfaces.” These are, “combining plumbago, with or without poisoning or irritating matters,” with “asphaltum, pitch, or similar matter requiring heat, or a solvent and heat, to render it fluid,” for the above purposes. The surface to be coated is cleaned, and receives three coats, when it “may be rubbed with rubbers or pieces of felt,” which produces an “even surface of polished blacklead.” The plumbago may be combined “with sufficient quantities of gums, fatty, resinous, or waxy matters, gutta percha, caoutchouc, or other plastic or easily fusible mediums.”

426 INDIA RUBBER AND GUTTA PERCHA :

The poisoning or irritating substances employed are, "the oxides and sulphurets of arsenic, the combination of its oxides with the oxides of lead and copper, or these latter oxides alone, carbonate of barytes, the oil of croton, tigilium, or other poison applicable to the purpose."

[Printed, 3d.]

A.D. 1854, February 2.—N° 262.

WATSON, HENRY.—"Improvements in the working of brass and copper into forms, and planishing them." These are, forming and planishing brass and copper by machinery as follows:—"Hammers are mounted in suitable framing, and are moved away from the fixed anvils by means of a revolving axis and cams; and the hammers produce the percussive action on the parts of the article (as they are presented by the workman) by gravity, regulated or aided by springs, the strokes of the hammers being adjusted to any degree of force required by adjusting the pressure on the springs," preferring "to use vulcanized india rubber rather than other substance for the springs," "against which the stems of the hammers are pressed by the revolution of the axis, and according as the springs are adjusted in position so will be the effect of their reaction on the hammers."

[Printed, 6d.]

A.D. 1854, February 3.—N° 268.

BELLFORD, AUGUSTE EDOUARD LORADOUX (*a communication*).—"A new system of apparatus, to be called 'atmospheric post,' for transmitting letters and messages, and applicable to railways and as a speaking trumpet."—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists of cast-iron pipes, with air-tight joints, laid down along and parallel to the lines of railway, with a branch pipe at each station. On this branch pipe is fitted another pipe, "and having a vertical pipe" "erected in the centre of a chimney belonging to a steam boiler." Near the base of this vertical pipe a blast pipe enters where a valve or cock is opened. The letters are contained in "spherical boxes of about two millimeters less diameter than that of the piping they have to

" pass through." The fireman at the station opens the valve or cock, and lets the steam blast into the vertical tube; this draws out the air from the carrying pipes, and the boxes with the letters follow, " pushed forward by the atmospheric air " entering behind them. " When the travelling boxes have past the branch " pipe their speed is gradually reduced by the resistance of the " column of air, which they force back into the extremity of the " channel, and finally they get out by opening the hinged " shutter. This latter consists of an india-rubber buffer suspended by a ballistic pendulum. The deadened shock of the " box pushes back the pendulum, which allows them to get out " and fall into a basket at the end of the channel," &c.

[Printed, 3d.]

A.D. 1854, February 3.—N<sup>o</sup> 275.

MEEUS, PIERRE JOSEPH.—" Improvements in the manufacture " of threads from or with gutta percha, and in ornamenting the " same." These are, first, " by cutting thin sheets of gutta " percha into strips, and twisting such strips either singly or two " or more together with the aid of heat and compression, so as to " form round threads." Second, " by twisting or twining a strip " or strips of gutta percha round a thread or core of textile ma- " terial or metal, or by passing such thread or core through a " solution of gutta percha." Third, " ornamenting gutta-percha " threads " " by the direct application thereto of metal leaf, metal " powder, or other substance in powder, either before or after such " threads have been woven or otherwise worked into fabrics."

[Printed, 3d.]

A.D. 1854, February 6.—N<sup>o</sup> 289.

GRAHAM, JAMES BALIE.—" Improvements in the production " of printing surfaces." These are, " the system or mode of " producing printing surfaces by depressing portions of a com- " pound surface or mass, made up of pins, type, or pieces of " metal or other suitable material;" and " producing printing " surfaces, by moulding gutta percha or other suitable material " upon a compound surface, made up of pins, type, or pieces of " metal, or other suitable material, portions of such surface having " been depressed to the required pattern."

428 INDIA RUBBER AND GUTTA PERCHA:

See "Abridgments of Specifications on Bleaching, Dyeing, and Printing."

[Printed, 7d.]

A.D. 1854, February 6.—N° 292.

TRUMBLE, PETER. — "Improvements in paper hangings." These are, "manufacturing paper hangings with oil colors instead of water colors," as follows:—"Take the same description of paper as is commonly used by paper stainers," and "coat or cover the surface thereof with a composition made with the following ingredients, matters, or substances; namely, a solution of india rubber, tallow, japan, or boiled oil, soap, and size." "These ingredients are well mixed and incorporated together" in certain "proportions" "in any convenient manner." Having thus prepared the paper, "proceed (in the manner usually practised by grainers on wood) to marble or otherwise ornament the surface of the paper with oil colors, composed of the following ingredients; namely, oxichloride of lead or zinc, japan, turpentine, and raw linseed oil, mixed in the ordinary manner, to produce the desired colors," &c.

See "Abridgments of Specifications upon Paper, Pasteboard, Papier Mâché. Part 2nd."

[Printed, 4d.]

A.D. 1854, February 7.—N° 293.

MOSELEY, JOHN WARBURTON.—"An improved method of uniting glass and argillaceous cylinders and tubes for conducting water and other fluids.—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists in employing gutta percha and caoutchouc for the above purposes, "by rolling them round the extremities of the closely-approximated tubes, having first sufficiently softened them by the application of heat," and "thus weld the tubes at their point of junction, and confine the bands more tightly by a wrapper of cord." "Also, in the case of tubes of large dimensions, dissolve the gutta percha or caoutchouc in some chemical solvent to a proper consistence for its being spread on a bandage, and then surround the extremities of the tubes therewith."

“ Also use another method of applying gutta percha or caoutchouc to the junction of the tubes by rings or segments of cylinders of either of such substances.” “ The result of this method of joining separate tubes, as above described, is to effect a water-tight conduit of any required length, capable of resisting any considerable pressure, and preventing the escape of liquids or chemical fluids, and affords advantages for drainage and other important objects.”

[Printed, 3d.]

A.D. 1854, February 8.—N° 306.

REES, EDWARD THOMAS.—“ Improvements in pressure slide valves in steam engines, to be called ‘ the anti-pressure valve.’ ” —*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists in “ the application of vulcanized india rubber let into the top of the valve by leaving a vacancy in the casting of the valve to receive a ring of india rubber, two inches wide, by one inch and a half thick.” “ The casting to be circular at the bottom, to receive the india rubber, and at the top the vacancy in the casting is to be three quarters of an inch wider than the india rubber, or thereabouts, to allow for compressing the india rubber; the india rubber to be manufactured in one piece.” “ A plate of metal to have a rib formed in the casting thereof, which rib is to press on the india rubber, and to be fitted on the piece left in the valve for that purpose. The elasticity of the india rubber keeps the plate steam-tight against the back plate of metal, and the said back plate is made secure on the pieces left in the steam chest for that purpose, or secured in any manner that may be convenient, so that, let the pressure be what it may on the plate, it will not press on the valve.”

[Printed, 3d.]

A.D. 1854, February 9.—N° 310.

DALTON, JOHN.—“ Improvements in the construction of bowls or cylinders employed in printing and other processes, and which improvements may also be adapted to other mechanical appliances,” as follows:—“ Pieces of wood are first cut from the

430 INDIA RUBBER AND GUTTA PERCHA:

" solid block into segments of a circle of the required size, and  
 " these several segments are afterwards arranged and united  
 " together with gutta percha, shellac, or other substance, so as to  
 " form a solid cylindrical body, each segment being so cut and  
 " placed that the fibre or grain of the wood may stand vertically  
 " in relation to the centre." " An iron shaft is fixed through the  
 " centre, and the surface of the bowl turned true and even in a  
 " lathe."

[Printed, 7d.]

A.D. 1854, February 9.—N° 313.

VOUILLON, FRANÇOIS (*a communication*).—" A new process of  
 " protecting the silvering of looking glasses," " with an air and  
 " water proof covering," as follows :—"The glass is laid on a table,  
 the silvered side uppermost; " then pour upon the silvering or tin-  
 " ning common varnish diluted with half its weight of essence of  
 " turpentine;" cause it to circulate all over, and, draining the excess  
 off, let what remains dry in the open air; after this, apply several  
 coatings of the " varnish alone" " by a camel-hair brush;" after-  
 wards cover the varnish with a muslin tissue " large enough to  
 " cover all the glass and edges." Pour upon the muslin the first  
 diluted solution of varnish, allow the excess to run off, and, when  
 dry, coat it by means of a soft brush with " a concentrated solu-  
 " tion of caoutchouc;" over this " pass a layer of varnish, and  
 " two or three coatings of oil paint." " Collodion or gutta percha  
 " might be employed as a substitute for caoutchouc," &c.

[Printed, 3d.]

A.D. 1854, February 10.—N° 330.

BRIDGES, HENRY.—" Improvements in buffers for railway car-  
 " riages or waggons."—*This Invention did not proceed to the Great*  
*Seal*.—It consists " in enclosing a coiled metallic, india-rubber, or  
 " other spring in a cylindrical box or case, which is made to slide  
 " within an outer cylinder or case, whereby the inner cylinder will  
 " be supported and prevented from bursting or bulging when any  
 " undue strain is put upon it." " The buffer head is secured to  
 " a rod or bar which passes through the two cylinders to the frame  
 " of the carriage, and holds the several parts together, but they  
 " may be quickly taken asunder by removing a cross pin or bolt,

" which retains the rod or bar in its place and prevents it from  
" being withdrawn until the cross pin is taken out, after which the  
" parts may easily be taken to pieces and repaired if required."

[Printed, 3d.]

A.D. 1854, February 13.—N° 342.

BROWN, WILLIAM.—" Improvements in printing machinery."—*This invention did not proceed to the Great Seal.*—In these improvements " there is an endless band of sheets passing  
" through the machine, and the inking takes place during  
" the changes of the sheets ;" the " endless band is of thin  
" steel plates, chains, gutta percha, or other suitable material,  
" which bands carry the paper frames, on which are fixed  
" the grippers for holding the sheets in their progress through  
" the machine," and " in order to carry the sheet perfectly flat  
" during its progress," tapes or bands of vulcanized india rubber  
are employed.

[Printed 3d.]

A.D. 1854, February 13.—N° 343.

EDWARDS, THOMAS.—" A new or improved fastening for  
" articles of dress," such as " leggings and such other articles,"  
consisting of " two rigid strips or bars, connected with the two  
" parts of the article of dress to be fastened together, the said  
" strips or bars being connected to and disconnected from each  
" other by means of hooks." " The two strips of metal, or other  
" rigid material, are inserted in the edges of the legging, for the  
" purpose of stiffening the same, and carrying the parts of the  
" fastening ;" on the one is a hook, and on the other a catch fixed  
near the upper part of the strips for fixing the upper part of the  
legging, while the lower ends of the legging " are connected  
" together by a band of vulcanized caoutchouc" or " other elastic  
" material, by which the said ends are drawn together." Other  
modifications of this fastening are described.

[Printed, 8d.]

A.D. 1854, February 13.—N° 348.

BROWN, SAMUEL RUSSELL.—" Improvements in printing  
" textile fabrics and other surfaces."—*This invention received pro-*



*visional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—In this invention, relating to a system of relief or surface printing, “the pattern or device is primarily produced in intaglio, “in wood or other material, by the use of ‘Wright’s mould-making machine,’ or other contrivance suitable for producing “sunk figures.” “This forms the mould or matrix, from which “a cast is taken in type metal, gutta percha, or other material, “the casting or counterpart so produced being in the form of a “flat plate, with the pattern in the relief upon it.” “These “relief or surface printing plates are then bent round a roller or “curved surface, and attached thereto to produce the relief printing roller or cylinder.” “The muslin or other goods are then “printed by such roller according to any of the existing systems “of roller and cylinder printing,” &c.

[Printed, 3*d*.]

A.D. 1854, February 15.—N<sup>o</sup> 367.

JENNINGS, THOMAS.—“Improvements in stoppers for bottles,” preferring to use “as a core, a hollow plug of wood, which will “yield sufficiently to permit of its taking the irregular shape of “the neck of the bottle in which it may be inserted.” When bottling wine which is required to ripen “use this hollow plug “without any addition, further than a square head, which is in “one piece therewith, and as the air will permeate through this “stopper, the ripening of the wine will proceed as when contained “in a cask.” For some other liquids, as where acid is present, “close the lower end of the hollow plug with an inverted cap of “gutta percha or other analogous gum, and thereby prevent “contact between the wood and the liquid.” Or, instead of a wooden plug, “use a hollow gutta percha plug, having the like “yielding property,” and this “secure to a solid head of wood, “slate, or other substance which will admit of the holding down “wires being inserted therein.” When bottling liquids “containing an alkali, as soda water, it is desirable to prevent contact “between the liquid and the gutta percha, or other analogous “gum, and to this end” “cover so much of the gum as would “otherwise be exposed to the liquid with a thin coating of tin, or “an alloy of tin, or with any other metal or metals not liable to “corrosion from the liquid,” “in which manner gutta percha or

"other analogous gum can be used in situations" "where, if  
"exposed, it would detract from the quality of the liquid."

[Printed, 6d.]

A.D. 1854, February 21.—Nº 417.

SMITH, JAMES.—"Improvements in ornamental weaving."  
These relate to the manufacture of goods "of the 'lappet' class,  
"wherein the use of the ordinary pattern barrel or wheel is  
"dispensed with." "The usual 'whip' rolls are also super-  
"seded." "Instead of the pattern barrel, a small cylinder  
"is used, carrying an endless chain composed of small slips of  
"wood, gutta percha, or other material capable of being shaped  
"to the required form of link, and hard enough to withstand the  
"working action." Or, "instead of this contrivance, a framework  
"or combination of plates or slips of iron, wood, or other mate-  
"rial may be used, such pieces being acted upon by a cylinder  
"with perforated cards, so as to produce the required pattern by  
"acting upon the usual figuring mechanism of the loom. This  
"movement is on the principle of the jacquard. In the endless  
"chain arrangement, the links of such chain are formed and  
"arranged to suit the intended pattern to be woven." "The  
"pattern or figure is engraved or formed either in intaglio or in  
"relievo, upon the external face of the chain, as many lines of  
"pattern or figure being used as there are needle frames. These  
"pattern lines extend continuously over the chain, and a pin or  
"catch from each needle slide is connected with or enters into  
"each of such pattern lines. The endless chain is made to  
"traverse to suit the loom action, and the needle frames governing  
"the figuring movements are thus made to traverse for the  
"figuring action." "In addition to this movement the endless  
"chain carries a secondary figure actuating a set of cranked pieces  
"which communicate with the lines of needles, so as to throw in  
"or out such sets of needles as the pattern may require." "In  
"dispensing with the 'whip' rolls, the cops or bobbins of whip  
"material are applied directly to the loom. This whip yarn is  
"used in its natural untwined condition, and as many ends or  
"lines of yarn are passed up in combination from these cops as  
"may be necessary for the production of the required figuring  
"thread. These lines of yarn in passing from the cops are kept  
"at a regular even tension, by being passed between frictional

434 INDIA RUBBER AND GUTTA PERCHA :

"spring holders, or elastic clips, so as to dispense with any other mechanism, and guide the yarn uniformly to the fabric as the weaving goes on."

[Printed, 11d.]

A.D. 1854, February 22.—N° 425.

MORISON, JAMES.—"Improvements in celestial and terrestrial globes."—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It relates "to the manufacture of celestial and terrestrial globes for educational and scientific purposes," "by inflating elastic or other globular chambers so as to produce the required spheres out of collapsed fabrics." "A convenient mode of doing this is that of taking two hemispherical cups or sheets of india rubber, and cementing the two sections together to form a complete globe, which can then be inflated with air or distended by the admission therein of other matter, as a liquid, for the production of an even globular form." "These inflatable or distendable chambers may obviously be made of various materials and in various ways, the system of distension affording a convenient and economical means of securing the required globular form."

[Printed, 3d.]

A.D. 1854, February 22.—N° 427.

ASSANTI, DAMIANO.—"A means of rendering porous substances waterproof." Take "one part by weight of dry gutta percha, cut it up into small pieces, and add four parts of sulphuret of carbon;" "keep this mixture at a temperature of about 77° Fahrenheit, and agitate it at least six times in twenty-four hours. In two days the solution will ready for use." The solution is placed in any suitable closed vessel which will admit of being heated in a water bath. "Wet down the goods to be waterproofed in this vessel, and cause the solution to cover them entirely;" then place the vessel in a water bath and heat it for five hours, without, however, carrying the temperature to the boiling point." "When the temperature of the bath has fallen to about 85° Fahrenheit," "remove the goods, allow them to drain, and place them in another vessel, which is again heated in a water bath, in order to evaporate and

“ condense the remainder of the sulphuret of carbon. The goods  
“ are afterwards removed from this vessel, are then dried or  
“ allowed to dry, and are submitted to pressure or not according  
“ to their nature.” Other solvents of the gutta percha may be  
used. “ If the substances to be saturated are too compact to  
“ absorb the solution by simple immersion, such, for instance, as  
“ blocks of wood, it is necessary to force it in by exhausting the  
“ air from the wood, and by pressure applied on the surface of  
“ the solution, as is done in the preservation of timber.”

[Printed, 3d.]

A.D. 1854, February 24.—Nº 442.

RYDER, WILLIAM, and RYDER, JAMES.—“ An improved  
“ composition applicable to coating metals.” “ Dissolve two  
“ pounds of gutta percha and four pounds of common resin, or  
“ tar, or pitch, and one ounce of gum shellac, in four gallons of  
“ coal naphtha; these ingredients are placed in a suitable vessel  
“ and heated to about one hundred and sixty degrees Fahrenheit,  
“ until the solids are completely dissolved.” “ It may in some  
“ cases be preferable to substitute asphaltum for the common  
“ resin, tar, or pitch above mentioned, and impure benzine or  
“ other volatile hydrocarbons obtained from bituminous shales or  
“ schists may be substituted for the coal naphtha.” “ When this  
“ improved composition is applied as a paint, colouring matter  
“ must be added to give the required tint or colour.”

[Printed, 3d.]

A.D. 1854, February 24.—Nº 449.

GREEN, BENJAMIN JOSEPH.—“ Improvements in the manu-  
“ facture of corrugated elastic materials.” These are, first, “ the  
“ use in corrugated elastic fabrics of a thread, cord, or ribbon of  
“ gut, silk, flax, or other suitable fibrous material, to be used  
“ along with the outer caoutchouc threads as a preventive to  
“ overstretching the same.” Second, “ the use in corrugated  
“ elastic fabrics of an ‘inner lining,’ or middle piece, by which  
“ much additional strength is given to the material, the front  
“ piece of which may by this means be made of the most delicate  
“ kind.” Third, “ the use in corrugated elastics of the front  
“ piece narrower than the back, for the purpose of preserving a

436 INDIA RUBBER AND GUTTA PERCHA :

“ selvage on the front side, which greatly improves the appearance,  
 “ and prevents the front piece, which is sometimes black leather  
 “ or other dyed material, soiling anything that may be worn or  
 “ used in contact with it.”

[Printed, 6*d*.]

A.D. 1854, February 25.—N° 459.

SIEMENS, CHARLES WILLIAM (*partly a communication*).—  
 “ Improvements in electric telegraphs.” These are, first, “ the  
 “ arrangement of insulators to support metallic line wire, by  
 “ cementing a metallic stalk into a thimble or cup of insulating  
 “ material with a projecting rim, presenting an enamelled or  
 “ glazed surface, which cup is again cemented (by means of  
 “ sulphur or otherwise) into the bottom of a cast-iron cup, afford-  
 “ ing protection and support.” Second, “ fastening the ends of  
 “ adjoining pieces of telegraphic line wire into a common insu-  
 “ lated stalk of metal by means of wedges introduced into  
 “ notches from the opposite sides to the lengths of line wire.”  
 Third, “ discharging the static electricity or lightning from tele-  
 “ graphic line wire through a vacuous space between two metallic  
 “ surfaces which are attached, the one to the line wire, and the  
 “ other to the earth.” To accomplish this, an apparatus is  
 employed which may be described as follows:—A hollow cylinder  
 “ of glass, gutta percha, or other non-conducting material,” has a  
 top and bottom of metal cemented tight. A metallic disc is  
 screwed in the interior of the bottom, “ and serves to regulate the  
 “ distance between the two metallic faces ;” the cover is per-  
 forated with a hole, which is closed by a stopcock, “ and serves for  
 “ the extraction of the air from the interior ;” two set screws, at  
 top and bottom, “ are provided to establish metallic connection  
 “ from the one side to the line wire, and from the other to the  
 “ earth.” Fourth, “ certain arrangements ” whereby telegraphic  
 communication is established “ along a railway train which is in  
 “ motion without the necessity for special connections between  
 “ the carriages.”

[Printed, 11*d*.]

A.D. 1854, February 25.—N° 461.

COLLIER, GEORGE.—“ Improvements in twisting fringes of  
 “ shawl and other fabrics.” These consist in “ the use of rotating

“ friction surfaces of vulcanized india-rubber or other elastic material, between which and concentric plates having cross lines or roughened surfaces the threads to form the fringe of the fabric are conducted. The fringe threads are first divided by instruments into quantities, as required, and twisted by being rubbed between the rotating surface and its concentric plate. The quantities of threads thus twisted are then put together by other instruments in pairs, and passed between a second flexible roller and its concentric surface, by which they are twisted together in the opposite direction, forming a twisted fringe.”

[Printed, 1s. 7d.]

A.D. 1854, February 27.—N<sup>o</sup> 470.

CHAPPUIS, EMILE.—“ Improved apparatus for the diffusion of light called illuminators.” These are constructed as follows:—“The reflecting medium is glass of a prismatic form, joined together in plates, and retained by a frame of gutta percha, glass, wood, or other material, and cemented, if needful, with Bohemian cement or other viscous matter.” “These plates are to be cemented together or attached by means of rivets of silver wire, or by any other suitable means, until the required size of the reflector is obtained; then they are to be fixed in the grooves of the case, which may be either of gutta percha or other material, cement or other adhesive matter being used, if required, to make the joints tight.” “This reflector is then to be fixed at the proper angle outside a house, shop, or in any other position in which the solar light may reach it, and be reflected and diffused.”

[Printed, 3d.]

A.D. 1854, February 28.—N<sup>o</sup> 481.

BELLFORD, AUGUSTE EDOUARD LORADOUX (*a communication*).—“Improvements in the means of admitting the steam or other motive-power agent to, and exhausting it from, the cylinders of oscillating engines.” These are, “admitting the steam or other fluid to the cylinder” “by means of pipes” “arranged in a circle described from the axes of the cylinders’ oscillation and entering opposite sides or ends of a steam chest attached to the cylinder, whether the admission of steam be controlled

" by a valve" in "the said steam chest or by movements of a slide valve;" and in carrying out the above, "these pipes are made to fit steam tight in the ends of the steam chest by packing in stuffing boxes," consisting "of a ring or rings of india rubber," "which are tightened around the pipe by a gland of the usual kind." "In order to compress the packing very closely towards the centre or around the pipe, two metal rings are employed, the former being flat and fitting closely but not tightly round the pipe at the back of the stuffing box, and the latter fitting easily to the pipe and loosely in a recess in the back or bottom of the gland, and having a conical recess on the side next the packing."

[Printed, 10d.]

A.D. 1854, February 28.—N° 491.

HOLBECHE, JOHN SODEN.—"Improvements in the construction of invalid bedsteads, which said improvements are also applicable for couches, chairs, and reclining seats or beds for invalid carriages." These are, "the use of caoutchouc or other springs acting longitudinally, such as helical springs in bedsteads, chairs, couches, and carriages, such springs being so adjusted as to counterpoise the body."

[Printed, 1s. 4d.]

A.D. 1854, March 1.—N° 493.

GILBERT, HENRY.—"Improvements in connecting and supporting artificial teeth."—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists in covering springs "of steel or other suitable material which are to be employed for connecting and supporting the upper and lower sets of teeth with prepared gutta percha or prepared india rubber separately or combined." Also in some cases applying "a thin coating of gold by the electrotype process to the exterior of the india-rubber or gutta-percha covering." Also constructing springs "of steel covered by a thin coating of gold applied by the electrotype process." Also constructing "springs" "of solid or tubular form of prepared india rubber or gutta percha separately or combined."

[Printed, 3d.]

A.D. 1854, March 1.—N° 494.

CORTIN, JEAN TOUSSAINT.—“Soling shoes and boots with leather combined with gutta percha and wood, sewed with metallic wire.”—*This invention did not proceed to the Great Seal.*—“Instead of using as usually the sole leather for soling shoes and boots,” “making soles combined with leather in one part, gutta percha in another, and wood in the third; and this combination being performed, sew the soles to the shoes and boots with a metallic wire,” so that “shoes and boots worked in that manner are cheaper and stronger than the other ones.”

[Printed, 3d.]

A.D. 1854, March 1.—N° 500.

ROUSSEL, SIMON.—“A new system of painting and colouring glass, being an imitation of old and new church window glasses, called typophanic.” This consists “in manufacturing diaphanous plastic products of every kind in gutta percha, bees wax, and other wax, resinous matters, gluten, horny substances, horn plates, moulded by pressure or other similar means, coloured in the bulk of the glass, or made of two plates of different colors superposed, or of designs colored after their manufacture, or in reproducing the transparent plastics by moulding the glass or crystal, or by employing more fusible glass, composed with metallic oxides. The basso relievos, either inlaid or embossed, may also be remoulded, and when exposed to the light produce identical effects.”

[Printed, 3d.]

A.D. 1854, March 1.—N° 503.

ILLAKOWICZ, MICHEL NAPOLEON.—“Improvements in picture frames.”—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists “in rendering the same picture frame susceptible of being enlarged or diminished in any given proportion, and that without deranging the position of the ornaments.” “These expanding picture frames, and also the ornaments used with them, can be made of any suitable metal or other material, such as gutta



440 INDIA RUBBER AND GUTTA PERCHA:

"percha, papier maché, wood, or of any combinations thereof." These frames "are made in eight principal pieces; the usual frames being divided into four at the centres of the four pieces composing the frames." "At the back are four other pieces, on which, by means of mechanism, the four corner pieces are made to slide; thus the proportion of the paralelogram, as well as the size, can be changed at pleasure."

[Printed, 3d.]

A.D. 1853, March 2.—N° 513.

DAWSON, THOMAS.—"Improvements in umbrellas and parasols." It consists "in covering the frames of umbrellas and parasols with a cover of cloth or other suitable material, whether made waterproof or not, the joints of which are formed, united, or secured by a solution of caoutchouc, gutta percha, or other like adhesive material, spread upon strips of silk or other suitable material, or upon overlapping parts at the edges of such joints."

[Printed, 3d.]

A.D. 1854, March 3.—N° 520.

SPILL, GEORGE.—"Improvements in the application of water-proof hat bands to the manufacture of hats."—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists "in constructing a hat, to which a hat-band, rendered waterproof by any suitable waterproofing composition, is immoveably united by the said waterproofing composition, or by some other suitable adhesive composition, so as to secure the junction of the felts of the hat body and hat brim from the moisture which is liable to penetrate there-through," &c., preferring to construct the hat "in such manner that the felt on the hat brim may extend a little way over the hat body, while the felt of the hat body may terminate at or near the same line, so as to meet the said felt of the hat brim at its termination, where the edges of both will be covered by the middle of the hat band; one of these edges may also, if thought fit, somewhat overlap the other."

[Printed, 3d.]

A.D. 1854, March 3.—N° 524.

VAUGHAN, WILLIAM, and SCATTERGOOD, JOHN.—“Certain improvements in machinery, apparatus, or implements for weaving.” These are said to be six in number, and in describing them reference is made to a former Patent, No. 1948, in 1853. One of these improvements is said to be “instead of wood, as the material of the body of the shuttle,” substituting “gutta percha, moulded into the required size and form, and fitted with tips, eyes, and skewers or spindles of the ordinary kind.” “The body of the shuttle with its necessary cavities may be formed in one piece,” but it is preferred “to form it in two parts, divided by a plane, either vertical or horizontal, passing through the points of the tips, which latter are to have their tangs or tails of a flat and expanded form, with teeth or protuberances raised upon their surfaces, so that when the two parts of the shuttle are closed and compressed upon them and cemented together the tips may be firmly retained in their places by the protuberances on their tangs becoming embedded in the substance of the gutta percha.” “The eyes and spindles are to be inserted and secured in their places in the usual manner.”

[Printed, 11d.]

A.D. 1854, March 4.—N° 527.

DE BERGUE, CHARLES.—“Improvements in apparatus for bearing and buffing purposes.” These are, first, “in making or constructing the brass or other suitable metal bearing or step, so that it shall itself form and constitute the upper and principal portion of the axle box, and that the grease cup shall by that means be formed in and become part of the actual brass or bearing, and that it may also be made to form in itself the requisite projections at the back and front of the box, which serve in connexion with the other parts to enclose the journal, and protect it from mud, dust, &c., &c.” Second, “in connecting or securing two or more of the axle boxes above described together (in a direction at right angles to the axles to which they are to be applied) by bars, plates, rods, or other equivalent or suitable means, so as to maintain them in their proper positions.” Third, “in the adaptation to the spindles, rods, guides, or framing of indian rubber, leather, or other suit-

“able material, for the purpose of allowing a certain amount of play, and of lessening noise and vibration.” Fourth, “in so ~~coating or rolling~~ the two principal pieces or parts” of the cases or framing or that description of buffers or buffing apparatus for carriages in which vulcanized indian rubber or metal springs are employed, to afford the requisite elasticity, and are enclosed in telescopic or sliding cases or framing,” “as that the one may not only slide within the other; but that they may also be properly held together by the form of the pieces or parts themselves, instead of depending upon a central rod or bolt for that purpose.”

[Printed, 1s.]

A.D. 1854, March 4.—N<sup>o</sup> 529.

ABATE, FELIX.—“Improvements in printing on and ornamenting surfaces.” These are as follows:—“Wetting the surface of the object” to be represented “with diluted acid or acid salt, or exposing it to the vapour of an acid,” and printing with it on any vegetable substance, such as wood, calico, paper, &c.;” afterwards “expose the latter for a few moments to a strong heat,” and dye the impression obtained. Modifications of the above are described. “To produce imitations of figured or damasked satin, take a sheet of tinfoil and lay it upon a piece of the silk stuff intended to be imitated, placing both between two pieces of

A.D. 1854, March 4.—N<sup>o</sup> 532.

STUART, JOHN KNOX.—“Improvements in hats and other coverings for the head.”—*This invention is void by reason of the patentee having neglected to file a specification in pursuance of the conditions of the Letters Patent.*—It relates “to the construction of hats, helmets, caps, and other coverings for the head, in such manner that perfect ventilation may be secured therein during use, whilst easy and comfortable fitting is also attained. The main body of the hat is constructed in the ordinary manner, or in the manner for which the patentee has already obtained Letters Patent, dated July 7th, 1853, N<sup>o</sup> 1623.” “Along the interior of the hat body is attached a series of tubes of horse-hair, india rubber, or other elastic material, such tubes being preferably disposed, so as to run in lines parallel with the axis of the hat. Instead of tubes the necessary elasticated materials may be arranged in plaits or folds, or in other ways which will afford the necessary elastic action.” “These elastic surfaces are then covered over with a lining piece; and thus, whilst a free circulation of air round the head is fully obtained, the fit is easy and comfortable,” &c. “This tubular system of ventilation may also be carried out in the common solid hat, or in the elastic tube hat already described herein. Instead of elastic tubes, an easy fitting surface is obtainable by curled hair or other padding suitably held in position.”

[Printed, 3*l*.]A.D. 1854, March 6.—N<sup>o</sup> 535.

GALLOWAY, JAMES.—“Improvements in the construction of cocks, taps, and valves. These are, “constructing cocks, taps, and valves, whereby the elastic or flexible diaphragm is pressed on to the orifices, and raised or lifted off them, without being connected or attached to the spindle or button by which the diaphragm is depressed.” The interior of the cock is cast with division, the upper edge of which is concaved, and when the diaphragm is pressed down upon it, it completely separates the inlet from the outlet orifice. The cap of the cock screws on to the body, holding between the two the diaphragm of elastic material, “mineralised india rubber” preferred; a screw fits into the body with a winged head, a button rests upon the diaphragm, while

444 INDIA RUBBER AND GUTTA PERCHA:

its "shank fits freely into a hole in the lower part of the screw."  
 "When no passage is required through the cock or tap, the wing  
 "head must be turned so as to press the diaphragm over the  
 "orifices;" "but when a communication is required between the  
 "two passages, the wing head is turned in the reverse direction,  
 "thereby allowing the diaphragm to rise off the orifices by its  
 "own elasticity, or by the pressure of the fluid in the supply pipe,  
 "with which the inlet orifice is connected," &c.

[Printed, 6d.]

A.D. 1854, March 8.—N° 556.

DEVINCENZI, GUISEPPE.—"An improvement in producing  
 "ornamented and figured surfaces and surfaces for printing  
 "from."—*This invention received provisional protection, but notice  
 to proceed with the application for Letters Patent was not given  
 within the time prescribed by the Act.*—It relates "to those kind  
 "of surfaces which are employed in what is known as 'nature  
 "printing,' that is to say, in which the surfaces for printing  
 "from are produced in lead, gutta percha, or Britannia metal by  
 "pressure;" "place the object to be re-produced upon a hard  
 "surface, and place thereon a copper plate which has been  
 "previously softened by being annealed or otherwise;" "then  
 "submit the whole to strong pressure, when the impression of  
 "the object will be produced upon the softened plate, which  
 "during the process becomes again hard, and is in a fit state  
 "for printing from, or it may be employed as a matrix from  
 "which to produce impressions or embossing in softened copper  
 "and in other metals and substances." "The plate so repro-  
 "duced from the first copper plate may also be employed to  
 "reproduce a fac-simile of the original" object "by a repetition  
 "of the first process, without, however, the intervention of any  
 "substance between the metals." Again, "the softened plate  
 "with the design or object produced thereon may itself be em-  
 "ployed as an ornamented metal surface."

[Printed, 3d.]

A.D. 1854, March 8.—N° 559.

BROWN, JOSEPH.—"An improved method of swinging furni-  
 "ture and other articles for travelling by sea or land, and other  
 "purposes."—*This invention did not proceed to the Great Seal.*—

It consists, as follows :—"The above articles are made to retain  
" their horizontal position without oscillation, and consequently  
" prevent sea sickness by effectually counteracting the motion of  
" of the ship when used on shipboard." "Thus a swing table  
" for ship's use is made with one centre, on the ball and socket  
" principle; that is, a round hole is made about six inches  
" diameter in the centre of a fixed table at the top, to which is  
" fixed over the hole a hollow cone or socket, on which is placed  
" the table intended to swing on the top of the cone or socket;  
" and up through this is passed a rod, at the bottom of which  
" is a weight fixed into the centre of the bottom of the table;  
" the table will then swing freely, the weight keeping it in the  
" horizontal position required, and thereby counteracting the  
" motion of the vessel or carriage;" and in order to prevent  
" oscillation and adjust the balance," "indian rubber or other  
" springs are attached," in the same way as "is done in N° 156,  
" October, 1852."

[Printed, 8d.]

A.D. 1854, March 10.—N° 574.

MOSELY, SIMÉON.—"Improvements in the manufacture of  
" artificial palates for the adaptation of artificial teeth;" these  
" are as follows, first, take an impression or cast of the form of  
" the mouth to be fitted with the metal palate," which "make of  
" a corresponding shape to the said cast by striking up a piece  
" of gold, silver, platinum, or other precious metal by any of the  
" means in known and common use for shaping articles in sheet  
" metal, or any combination of the said precious metals alloyed  
" with other metals, in the manner usually practised," and  
" attach the artificial teeth to such said palate by forming holes  
" in the plate, and rivetting or soldering thereinto the pin to  
" which the tooth is affixed, or by any suitable and convenient  
" means, and, if necessary," "strengthen the edges of the palate  
" by making such parts thicker than the other parts of the plate  
" of which the palate is formed." "And further, if desirable,  
" a piece of thin india rubber or caoutchouc of the same size as  
" the metal plate, and punctured with holes corresponding to the  
" indentations in the metal palate, may be employed to assist in  
" effecting perfect adhesion of the palate to the roof of the mouth  
" as the air is exhausted from the air cells or indentations in the  
" before-mentioned metal plate or palate."

[Printed, 3d.]

“ one of the plates by a nut (or it may be fixed in any way to the plate itself); on the other end of the bolt is a ring or hook. A ring or hook is attached to the end of the frame.”

[Printed, 3d.]

A.D. 1854, March 16.—N° 629.

WEARE, ROBERT.—“Improvements in the construction of galvanic batteries and apparatus connected therewith.” In carrying out these improvements, one is said to be as follows:—“lining as many single cells” as are “required with marine glue and paper, leaving holes at the bottom of each, or leaving the bottoms open as may be required; they are then placed in a wooden or any other frame, well coated with marine glue or otherwise, with any sufficient non-conducting substance; to the frame is then attached rods, springs, bolts or a pulley, &c., with a view to lift it up and down when required, the lid being made air-tight with a pressure valve in the top, either made with vulcanized india rubber, metal or any other sufficiently elastic material,” also attaching “a feeder to the battery with a vulcanized india rubber or any other water tight tubing,” raised on a shelf above the level of the battery, “or force the solution up from the bottom with a vulcanized or air-tight bag contained in the reservoir below,” &c. See “Abridgments of Specifications upon Electricity, Magnetism,” &c.

[Printed, 8d.]

A.D. 1854, March 20.—N° 661.

PERKINS, JOSEPH.—“Improvements in metallurgy, especially applicable to the production of type and ornamental forms.” These are as follows:—A cast of the surface required is taken “in gutta percha” or a suitable plastic substance; it is brushed over with plumbago, &c., and attached to a battery is coated by immersing it in a solution of copper or silver. When a thin coating is obtained and still attached to the gutta percha, the “surface of the back of the electrotpe” is moistened with a saturated solution of chloride of zinc, and an alloy of tin and lead, &c. run upon it till it is of sufficient thickness, when the gutta percha mould may be removed,

[Printed, 8d.]

A.D. 1854, March 22.—N° 670.

NEWTON, ALFRED VINCENT (*a communication*).—"Improvements in japanning leather and other fabrics." These are "preparing leather for enduring a great degree of heat, and "toughening the fibre of the same," and in the varnish used, as follows: "impregnating it with a solution of borax, nitrate of "potash, japonica, or any equivalents for the same combined with "sulphur, or any preparation of the same, or the sulphur may be "applied as a gas in ovens or closed chambers." "The varnish "ordinarily used in japanning leather is composed of oil, amber, "Prussian blue, litharge, white lead, ochre, whiting, asphalte, and "sometimes gum copal." Now the improvement in the varnish consists "in combining with any preparation of these materials "india rubber, gutta percha, or any other elastic gum, rosin, tar, "and sulphur, or any preparation of the same."

[Printed, 3d.]

A.D. 1854, March 25.—N° 703.

BIDDELL, WILLIAM ADOLPHUS.—"Improvements in alarums "and signals to be used in or on railways, ships, houses, build- "ings, plantations, or other places, for the purpose of giving "audible or visible signals in cases of danger or alarm."—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists "in placing the detonating or "explosive compound, which should be coated with gutta percha "or other substance capable of resisting damp, in a box, cylinder, "or case, in which is placed a moveable piston or block, so "arranged that it may be drawn forward and made to compress "the detonating ball or balls placed in the box, cylinder, or case, "and thereby explode the same, and cause a loud report." "Supposing the apparatus is intended to be applied to a door or "gate, or to the engine of a railway train, the box, cylinder, or "case containing the detonating composition is secured to the "door post or to the engine, and a cord or chain leading from the "moveable piston or block in the cylinder is attached to the "door or some other moveable part. It will now be understood, "that upon attempting to open the door, or to do anything that "will disturb the block or piston in the cylinder, the detonating



"balls will be exploded with a loud report, and cause an  
"alarum," &c.

[Printed, 3d.]

A.D. 1854, March 27.—N° 705.

FORTY, ARTHUR EDWARD, and HAYNES, WILLIAM.—"A  
"new composition of materials suitable for mouldings, and for  
"most purposes for which leather and gutta percha have been or  
"may be employed."—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists  
"in forming a composition of the more fleshy parts of hides and  
"leather (known as curriers' shavings), tan, gutta percha, or  
"caoutchouc, or gutta percha and caoutchouc and shellac;"  
and the composition is prepared as follows:—"Take curriers'  
"shavings and tan, and reduce them to small particles by a  
"tearing machine;" "separate dust and other refuse matter  
"from the leather shavings and tan by rubbing them over a  
"perforated plate," and "continue rubbing them until they  
"become soft and spongy; this mixture is then dried, and  
"thoroughly saturated with a solution of oil and spirits of  
"turpentine;" "next mix in a separate vessel gutta percha or  
"caoutchouc, or gutta percha and caoutchouc and shellac,  
"reduced into small particles, and boil the whole in water,"  
"which heat to from 190° to 230° Fahrenheit, and stir the mass  
"the whole time it is kept boiling." "Then evaporate the water,  
"and add the mixture of leather cuttings, tan, oil, and turpen-  
"tine in proportions varying with the qualities the composition  
"may be ultimately required to assume, and cause the whole  
"mass to become thoroughly amalgamated in a masticating or  
"other suitable machine." "Prepare a solution of gum, com-  
"mon salt, and sulphate of ammonia, dissolved and boiled in  
"water, and knead and work the composition therein for from 15  
"to 30 minutes." "The composition is thus formed, and may  
"be reduced to sheets by passing it through heated rollers, and  
"may, if necessary, be made to adhere to sheets or strips of  
"calico, linen, or other textile fabrics while so passing through;  
"the rollers may be moulded in a similar manner to the mould-  
"ing of gutta percha, and be otherwise treated in various ways."  
"When the new composition is required to be of a yielding

450 INDIA RUBBER AND GUTTA PERCHA:

“nature,” “add a portion of carbonate of soda, and saccharine  
“or gummy matter, to the solution of gum, salt, and sulphate  
“of ammonia.” “When the composition is required to be hard,  
“add a greater quantity of the leather shavings and tan.”

[Printed, 3d.]

A.D. 1854, March 27.—N<sup>o</sup> 706.

ARCHEREAU, HENRI ADOLPHE.—“Certain improvements  
“in treating powders of charcoal, coke, coal, peat, and generally  
“all matters obtained by the carbonization of mineral, vegetable,  
“and animal substances, & in applying the said powders to useful  
“purposes.”—*This invention received provisional protection, but  
notice to proceed with the application for Letters Patent was not  
given within the time prescribed by the Act.*—It consists in  
“forming from the carbonaceous substances above mentioned a  
“plastic material of variable consistencies, and possessing many  
“properties in common with gutta percha.” “The powder is  
“mixed in different proportions, according to the use of the  
“matter, with one or more of the following substances: coal tar  
“or natural ‘resin of Bastenner,’ residue of coal tar, pitch,  
“resinous and bituminous substances, gums, oils, varnishes,  
“glues, fatty and ceramic substances, and is then subjected to a  
“heat which renders the substance viscous or liquid.” “To  
“obtain a substance which can be laminated and drawn out in a  
“moderate temperature, mix about 100 parts residue of coal tar  
“or ‘natural coal tar of Bastenner,’ with 150 to 200 parts of  
“coal powder, and a little linseed oil, if required.” “The articles  
“made of this substance may be galvanized, or covered with a  
“film of metal.” To produce a harder material, “mix with the  
“coal powder either talc or pulverized earth, silica, alimina, or  
“any other substance suitable for that purpose.”

[Printed, 3d.]

A.D. 1854, March 28.—N<sup>o</sup> 712.

WOODWARD, JOHN.—“Certain apparatus for stopping shot  
“and other holes in ships and vessels.”—*This invention received  
provisional protection, but notice to proceed with the application for  
Letters Patent was not given within the time prescribed by the Act.*  
—It consists “in a peculiar apparatus, the head of which is

“ thrust through or into the hole from the inside of the ship,  
“ when a spring is caused to act upon and throw out two or more  
“ arms, which have been previously covered with leather, gutta  
“ percha, or other like suitable material, somewhat after the  
“ manner in which an umbrella covering is mounted upon its  
“ frame. The leather covering fits close to the vessel's side, and  
“ the outer ends of the arms, ribs, or frames are made to lie upon  
“ and embrace the vessel's side by means of a stretcher, mounted  
“ upon a screwed shaft, upon the upper part of which the inner  
“ ends of the arms are hinged. The stretcher is forced down  
“ against the arms by means of a nut.”

[Printed, 3d.]

A.D. 1854, March 28.—Nº 713.

ARCHEREAU, HENRI ADOLPHE.—“ Certain improvements  
“ in galvanic batteries.”—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists, first, in “waterproofing” “the lower part and bottom  
“ of the porous” cells used “in batteries with two liquids.” This “is effected by immersing it in molten bees’ or vegetable  
“ wax, or a solution of sugar, and calcining it,” but glazing it is preferred. Second, “in the application of a syphon, whose  
“ extremities are bent up, to the operation of filling and emptying  
“ the successive vessels of a battery.” Third, “another system of  
“ filling and emptying the exterior or impervious vessels or cells  
“ by means of a hole at or near the bottom of each.” The holes  
“ are stopped up and opened, when required, by means of cylindrical vulcanized india-rubber pieces, which may be either  
“ hollow or solid, and which fit tight into the holes.” “These  
“ pieces have heads of gutta percha or any other suitable substance which prevent them from being drawn into the vessels.” The stoppers are drawn by strings of gutta percha or any other suitable substance. Fourth, filling and emptying all the vessels of a battery at once, and without filling the room with fumes in which the battery is placed. The vessels of the battery are “contained in a box closed air-tight or nearly so.” The fumes “are  
“ led off by a pipe on the top of the vessel into a chimney where  
“ they may be condensed.” Over each row of vessels run two gutta-percha pipes, having branch pipes from each resting on the

542 INDIA RUBBER AND GUTTA PERCHA:

bottom, one into the porous and the other into the outer cell. These pipes are fed from a reservoir by a pump. The connections between each are made by "vulcanized india-rubber or other suitable material not attacked by the acids used," &c. Fifth, "introducing the positive and negative elements of a galvanic battery in a sheath or case made of india rubber," &c. If the battery has one liquid, it is sent between the elements by means of an opening in the centre of the elements," through which is put "a flexible or rigid rod of whalebone or solid india rubber," &c. Sixth, "obtaining dense pieces of blacklead or graphite by compressing blacklead powder" by hydraulic, &c. power, "these pieces being used in galvanic batteries."

See "Abridgments of Specifications upon Electricity, Magnetism," &c.

[Printed, 3*d*.]

A.D. 1854, March 30.—N<sup>o</sup> 725.

LUCEVILLIARD, JEAN FRANÇOIS. — "Improvements in fastening or sustaining to the body the various parts or objects of body clothing, equipment, and harnessing." These are, manufacturing by "knitting machines, or platting or lace machines, or looms, bands of cotton, wool, silk, or other fibrous material, having threads of caoutchouc or other suitable elastic material introduced into them, and having also a full or plaited border or margin on one or both edges of such bands, which border or borders serve for attaching the band to the object or article of clothing, equipment, or harnessing for which it is required." Thus, "one of these elastic bands may be used as a waistband or belt (with or without a buckle) for supporting a pair of trousers which are sewn to the border, and the band is thus attached to the trousers by the intervention of the border, without the elasticity of the band being impaired by its attachment to the comparatively inelastic material of the trousers." "If required, the band may be made with two or more borders at one or both edges."

[Printed, 7*d*.]

A.D. 1854, March 30.—N<sup>o</sup> 727.

JOHNSON, WILLIAM—(*a communication*).—"Improvements in galvanic electric, and magnetic apparatus."—*This invention*

*received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It relates “to various arrangements and constructions” of the above apparatus for “obtaining superior effects therefrom,” and “in the construction of the mariner’s and surveyor’s compasses;” “instead of pointing the magnetic needle at both ends, one end only is pointed, or the central portion is made narrow whilst the terminal portion is larger. The ends or centres of such needles are treated galvanically with zinc, copper, or other metal coatings to equilibrate the action. The boxes for the compasses are made of gutta percha to insulate the instrument.”

See “Abridgments of Specifications upon Electricity, Magnetism,” &c.

[Printed, 3d.]

A.D. 1854, March 30.—N<sup>o</sup> 736.

WILLIS, EDWARD COOPER.—“An improved mode of manufacturing gutta percha into sheets.”—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It relates to the manufacture of sheets of gutta percha suitable for medical purposes.” In “sheets hitherto prepared for such purposes,” “great tenacity has been obtained in the direction of the grain or fibre, but when subject to strain in the opposite direction the sheets would readily split into ribbons, and their use has consequently been abandoned.” In order to remove this objection, “take sheets of purified gutta percha, such as are now procurable in the market, and of the one eighth of an inch (more or less) in thickness,” and “subject them for a time to a bath of heated coal-tar, naptha,” then “remove the sheets, and subject them to a rolling operation in the direction of their length and breadth, until they are reduced to the desired thickness.” “Next drive off the naptha by exposure to the air or otherwise, and the sheets will then be ready for use.”

[Printed, 3d.]

A.D. 1854, April 1.—N<sup>o</sup> 747.

CLIFTON, Sir ROBERT JUCKES.—“An improved percussion shell.”—*This invention received provisional protection, but notice*

454 INDIA RUBBER AND GUTTA PERCHA:

*to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—The body of the “shell is “ of a cylindrical form and hollow, and the forward end is conical “ or conoidal, and composed of solid metal, while the cylindrical “ portion is closed with a greater or less thickness of metal,” forming a chamber for the powder, which is filled in by a plug-hole “ closed by a screw.” A nipple is on the conical part of the shell, and it “ is pierced with four or more passages in connection “ with the powder chamber by tubes, which have at their extre- “ mities cups or recesses formed to receive a small portion of “ percussion powder.” “These caps, when charged, are first “ covered with thin paper and afterwards with sand paper,” and in case of its striking a vessel under the water line, the whole of the outside of the conical part is “covered with gutta percha, “ or some other material impervious to water,” with the exception of wings or arrows attached to it.

[Printed, 3d.]

A.D. 1854, April 1.—N<sup>o</sup> 749.

BELLFORD, AUGUSTE EDOUARD LORADOUX (*a communication*).—“A new and useful fabric for boot and shoe soles, machine “ banding, and other purposes.”—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists “ of saturating cotton duck, canvas, or other woven “ fabric with a compound of gutta percha, pitch, resin, and fatty “ or oleaginous matter, of gutta percha and coal tar, or gutta “ percha and any pitchy or bituminous matter, and employing “ it either in a single piece, or in two or more pieces cemented “ together by the compound with which it is saturated, either “ with or without a layer of saturated loose fibrous material “ between the several thicknesses.” “In some cases the addition “ of spirits of turpentine may be necessary to perfectly dissolve the gutta percha.”

[Printed, 3d.]

A.D. 1854, April 1.—N<sup>o</sup> 752.

JOHNSON, JOHN HENRY (*a communication*).—“Improvements “ in printing fabrics, and in the machinery or apparatus employed “ therein.” These are the application and use “of caoutchouc,

“ either more or less hard, and in combination or not with other matters, or gutta percha, when hardened in a similar way, to the manufacture of printing rollers or cylinders.” “ A cylinder of wood or metal is covered with a coat of prepared caoutchouc in a soft state, and then submitted to a high degree of heat, as described by Charles Goodyear.” “ These cylinders having been thus hardened, are engraved in the same manner as ordinary copper printing cylinders or rollers, either in intaglio or in relief.” Such printing surfaces “ are not subject to injury from the action of the acids, alkalies, and other agents used by the printer.”

[Printed, 3d.]

A.D. 1854, April 1.—N° 755.

KESTELL, WILLIAM.—“ An improvement in fixing or cementing glass to metal.” If sheet metal be used, it is “ bent at the edges, so as to form a tray of the proper size to receive a piece or sheet of glass, with the device or devices thereon; or cast metal may be used. Between the metal and the glass a cement is applied; that which is preferred is composed of red and white lead, mixed with oil, and dissolved india rubber. The glass and metal having been placed together are put into a chamber which can be rendered vacuous. The metal and glass are pressed together by weights, or otherwise, when in the chamber, which is rendered vacuous by an air-pump or otherwise, the glass and metal will by these means be very securely fixed together.”

[Printed, 10d.]

A.D. 1854, April 3.—N° 761.

HODGES, RICHARD EDWARD.—“ Improvements in connecting wheels, drums, cylinders, and pulleys, with their naves, axes, and the parts thereof one to the other.” These are the application of straps or lengths of vulcanized india rubber between the naves or central parts and the exterior or periphery or other parts of wheels, drums, cylinders, and pulleys,” for the purpose of obtaining elasticity between the naves and periphery, and between other parts thereof. The straps of vulcanized india rubber are in

456 INDIA RUBBER AND GUTTA PERCHA:

a state of tension. Several arrangements for doing this are described.

[Printed, 9d.]

A.D. 1854, April 5.—N° 779.

GILPIN, WILLIAM.—“Improvements in electrical communication.”—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists, first, of a “plastic material for the purpose of insulating electric telegraph wires, the said material being composed of certain proportions of gutta pertha, pitch or tar, resin and oil.” Second, “a method of constructing subterranean electric telegraphs.” Covering wire alone, or wire covered with gutta percha, with fibrous materials steeped in “oil, rosin, and tar,” &c., &c.

See “Abridgments of Specifications upon Electricity, Magnetism, &c.”

[Printed, 3d.]

A.D. 1854, April 6.—N° 792.

NASH, JOSEPH.—“The manufacture and refining of sugar.” In describing the manufacture a claim is made “to the use of india-rubber rings or bands, with connected seats and loose covers for the ordinary sugar moulds,” &c. These moulds “are to be provided with a sufficient number of removeable covers for alternate use, these covers having at their edges a flange or groove to receive elastic india-rubber bands; and in the centre of these covers is a circular hole, either conical or otherwise, fitted to receive corresponding nozzles, which are also provided with flanges and india-rubber bands, and depending by short pipes from a horizontal liquor pipe.” “The horizontal liquor pipe is to be securely fixed underneath rigid framework, a convenient space above the tops of the moulds, when placed upon their respective seats, which may be either the usual earthen pots, or any other form of receiver or channel for receiving the syrup drainings,” &c., &c.

[Printed, 9d.]



A.D. 1854, April 7.—N° 812.

BENTLEY, WILLIAM HENRY.—“Improvements in irrigators  
“ or machines for watering grass and other lands, roads, floors,  
“ flowers, plants, shrubs, and trees, and applicable for all purposes  
“ for which ordinary watering-pots are employed, parts of which  
“ improvements are also applicable to pumps for raising and  
“ forcing liquids.” These “machines somewhat resemble an  
“ ordinary watering-pot.” Besides other arrangements, which are  
fully described, one is, that the “spout is made of an equal  
“ diameter throughout its length, in order to serve the purpose of  
“ a pump barrel,” “which may be used both to draw the water and  
“ also to force it.” In drawing from a well a gutta-percha tube  
is in communication with the source of supply, and attached to a  
socket at the foot of the spout, and “by working the pump the  
“ water will be drawn into the irrigator.” “In cases where a  
“ constant supply of water is required,” “have a gutta percha or  
“ other tube connected to the inlet aperture, and communicating  
“ with an elevated cistern, or with a tank, or other source of  
“ supply,” &c., &c.

[Printed, 11d.]

A.D. 1854, April 11.—N° 842.

BROOMAN, RICHARD ARCHIBALD (*a communication*).—“Im-  
“ provements in the manufacture of hats.” These are, forming  
“ felt cloth hats, so that they will afterwards maintain their shape  
“ and stiffness under all circumstances of ordinary wear, by intro-  
“ ducing gutta percha, either pure or in some of its combinations,  
“ between two sheets of felt cloth, and afterwards forming the said  
“ sheets into a hat by pressure, in a mould, while the gutta  
“ percha is in a plastic state.”

[Printed, 3d.]

A.D. 1854, April 11.—N° 844.

BROOKS, WILLIAM ELLIOTT.—“Improvements in valves for  
“ atmospheric railway tubes.”—*This invention received provisional  
protection, but notice to proceed with the application for Letters  
Patent was not given within the time prescribed by the Act.*—It  
consists “in the application to the longitudinal valve of atmo-

458 INDIA RUBBER AND GUTTA PERCHA:

“ spheric tubes of one or of two tubes of vulcanized india rubber, “ or other suitable elastic fabric or material, containing air, water, “ or other liquid or fluid,” “ so constructed and so adapted “ thereto, and so used in combination with a valve or covering of “ sufficient weight to compress, or partly compress, the same,” and so that, “ on their being compressed, it or they will collapse, “ or partly collapse, and render air-tight, or very nearly so, the “ valve or longitudinal opening or openings into the interior of “ the longitudinal tube;” also “the raising the longitudinal valve “ of atmospheric tubes by means of wheels or rollers or inclines, “ so connected with the piston or piston frame as to allow of the “ necessary play of the piston and frame, without causing shocks “ or vibrations to the longitudinal valve.”

[Printed, 3d.]

A.D. 1853, April 11.—N° 851.

SCOTT, URIAH.—“ Improvements in the adaptation of elastic “ material to boots and shoes, and shoes for horses and other animals.” These are, introducing between two or more plates india rubber or other elastic material. Sometimes “an inner shoe” is only used with “the india rubber or other elastic material.” It is “ preferred to construct the plates used for boots and shoes of brass, “ as these will allow of indian rubber being vulcanized with and “ cemented to them,” and “metal plates need not be used in all “ cases, as horn, tough wood, or other tough substance might be “ adopted, and in the cases where the plates are connected “ together by the edge leather, slices of stiff leather may be “ adopted.” “In all cases cover the arrangements by an edging of “ leather to obtain neatness and other advantages.” This invention “ may be applied to the heels and soles of boots and shoes.”

[Printed, 10d.]

A.D. 1854, April 13.—N° 866.

COX, ARTHUR HAWKER.—“ Improvements in coating pills and “ bolusses.” These are, employing “a gum, resin, or varnish,” “ insoluble in water or saliva, but acted on by the stomach,” for “ coating pills, &c. “Canada balsam, gum thus, frankincense, “ gutta percha, caoutchouc, gun cotton,” &c. may be employed.

A solution of either of these is made in "æther, alcohol, or other proper solvent," and the pills are immersed therein; "or otherwise moisten their surfaces in any convenient way." The pills are kept in motion afterwards "till the solvent is sufficiently evaporated to prevent adhesion to one another." A second coat is applied when the first is dry. Another mode of doing the above is, to coat the pills, &c. with any of the gums reduced to powder, and immerse them in the solvent; or immerse them first, and roll them "in the powdered resin" afterwards.

[Printed, 3d.]

A.D. 1854, April 13.—N° 868.

DEVINCENZI, GIUSEPPE.—"A method or methods of producing engraved, figured, and typographic surfaces for printing; and embossing from and for ornaments; also, certain machinery employed therein." In carrying out the above, a machine for printing is described for the purpose of producing, "without the ordinary typographical processes, print work to be transferred on to" a metallic surface, and by which can also be produced, "instead of ordinary typographic print-work, sunken impressions on soft metal plates, on gutta percha, or other substances which easily receive impressions, and these sunken impressions may be used either for taking proofs, for transferring them on to metallic surfaces, or for other purposes (in the case of metal plates), or for matrices for reproduction in relief by electro-plating or stereotyping."

See "Abridgments of Specifications on Bleaching, Dyeing, and Printing."

[Printed, 1s. 6d.]

A.D. 1854, April 17.—N° 883.

BENTLEY, WILLIAM HENRY.—"Improvements in cannons, guns, and other fire-arms, and in projectiles for the same." In these improvements, which relate to breach-loading guns, construction of gun carriages, projectiles, &c., one is coating such cannons, guns, and fire-arms with gutta percha or other suitable materials, so as to prevent rust or corrosion from exposure to moisture."

460 INDIA RUBBER AND GUTTA PERCHA :

See "Abridgments of Specifications upon Firearms and other Weapons," &c.

[Printed, 7d.]

A.D. 1854, April 18.—N° 891.

BERNARD, JULIAN.—"Improvements in stitching, and machinery and apparatus connected therewith." These are, "in the general arrangements, combinations, and mode of construction and disposition," as described, of stitching machines. Among these improvements one is said to consist in "giving the necessary pull to the thread or filament for tightening the loop or stitch," and which is performed "by means of a nipper or other mechanical equivalent for the purpose, instead of making the needle perform such operation." The instrument is kept near to its work by "a spring, which may be of india rubber." It is preferred to work the stitching machine "by the aid of clock-work, actuated either by a weight or spring of vulcanized caoutchouc, or an ordinary barrel spring," described in the Specification of a former Patent, N° 2837, 1853.

[Printed 1s. 1d.]

A.D. 1854, April 22.—N° 926.

HARLOW, JOHN.—"Improvements in the manufacture of paper, pasteboard, and millboard."—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists in introducing and pasting, or otherwise attaching, between two or more sheets of paper, pasteboard, or millboard, one or more sheets or layers of suitable woven textile fabric, When desirable, as for the purpose of making it into labels, coat either one or both sides of the paper thus manufactured with a composition of gold-size, turpentine, and white lead, or any similar composition which will resist the effects of weather, and admit of the surface being written on with a black-lead pencil, without fear of its being effaced."

[Printed, 3d.]

A.D. 1854, April 24.—N° 939.

NEWTON, WILLIAM EDWARD (*a communication*).—"The application of a new or improved material or substance to the construc-

"tion of certain parts of machinery." This material may consist as follows:—"One part by weight of sulphur to two parts by weight of india rubber or gutta percha, or one part by weight of india rubber and of gum shellac to one part by weight of sulphur," applying the necessary heat. When lightness is required, introduce "cork dust or chips, sawdust, cotton waste, or other vegetable fibre, in the proportion, say, of about one part by weight, more or less, to two parts of the other combined ingredients." Sometimes "from seventy-five to one hundred per cent." "of plumbago or black lead is added during the manufacture of the component parts of the material." These compounds are employed in the manufacture of "spindles, wharves, rollers, shuttles," &c., bobbins, &c., and "bearings for machinery."

[Printed, 4d.]

A.D. 1854, April 27.—N<sup>o</sup> 953.

OWEN, THOMAS GRIFFITH.—"An improved construction of portable filter."—*This invention is void by reason of the patentee having neglected to file a Specification in pursuance of the conditions of the Letters Patent.*—The chief object is "to provide a means for filtering the water used by soldiers during a campaign." For this purpose "construct what is known as the cavalry bucket in the following manner":—"The vessel, somewhat similar in form to the ordinary bucket," is formed by preference "of gutta percha, and divided into three compartments by means of two horizontal partitions, also of gutta percha, situate near the middle of the bucket." "The middle space fill with talc and powdered charcoal, or other suitable filtering medium, and allow the water from the upper compartment to enter this compartment through a central opening in the upper partition." "Openings are made in the lower partition to allow the water as it permeates through the porous bed to fall into the lower compartment, whence it may be drawn off by a tap." "The bucket is provided with a handle, as usual, and the gutta percha is japped or otherwise coated to prevent the water from imbibing an unpleasant taste therefrom." "For hospital purposes" "construct portable filtering water vessels on the same plan, the form being modified according to circumstances."

[Printed, 3d.]

A.D. 1854, April 27.—N° 957.

FARMER, Sir GEORGE RICHARD.—“Improvements in safety valves for steam boilers.”—*This invention did not proceed to the Great Seal.*—The “apparatus consists, 1st, of three distinct and separate valves of different sizes, one of which acts as a relief valve; they are placed in a single plate of metal screwed or rivetted on to the boiler; 2nd, of their rods or stalks; 3rd, of two upright side posts; 4th, of three cross rails; and 5th, of an inverted cylindrical dish and piston placed at the safety level of the water in the boiler.” “To prevent the ingress of steam into the inverted dish in marine boilers, a case of india rubber is to be attached to the outside of the top of the dish and on to the piston rod nearly up to the joint; the case is creased down to allow it to expand when the rod is forced upwards.” “Instead of levers and weights to keep down the valves, metal cases are used filled with india rubber. These cases are placed between the cross rails, and have loose tops and bottoms to fit the inside. The bottom plate rests on pins passed through the stalks or rods, each stalk passing through the middle of the top and bottom plate and india rubber. When the valves are forced open, the case is forced upward above the cross rail, pieces being cut out of the case on each side for this purpose, and the india rubber is thereby compressed against the upper rail. To preserve the india rubber from the heat of the stalk, a spiral spring or rings of ivory is placed on the stalk.”

[Printed, 3d.]

A.D. 1854, April 29.—N° 968.

VARLET, JEAN PHILIPPE.—“Improvements in obstructing the holes produced by accidents or projectiles in the hulls of ships and boats.”—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists in constructing a “flexible case or shell of waterproof cloth, caoutchouc, gutta percha, or other waterproof substance, which is passed under the damaged ship or boat and drawn up by ropes or otherwise, so as to envelope the hull of the vessel and prevent the entrance of water at the holes.” “In lieu of the complete case or shell,” “sometimes apply elastic and extensible bands

“ to the sides of the vessels below the water line, and when the  
 “ side of any such vessel is perforated by a cannon ball or other-  
 “ wise,” “ draw up the adjoining band or part of the band by  
 “ means of ropes, so as to extend it and cause it to cover the  
 “ hole.” “ A metallic plate may be interposed between the band  
 “ and the side of the vessel, if desired.”

[Printed, 3d.]

A.D. 1854, May 2.—N° 983.

WALLER, RICHARD.—“ Improvements in valves applicable to  
 “ steam engines and other purposes, and in apparatus connected  
 “ with the same.” These are, first, “ the peculiar construction  
 “ and arrangement of the valve,” “ covering it closely with a  
 “ moveable valve box with arms or projections, which box  
 “ is supported by and moves backwards and forwards on  
 “ rollers, carrying the valve with it,” &c., &c. Second, con-  
 “ sists “ of two sets of rollers, and two rollers to each set, with  
 “ flexible flaps to keep them at the proper distance asunder, so  
 “ connected that they move in the same direction, and as one  
 “ is gradually opening the port the other is closing it, by the  
 “ roller pressing down the flexible flaps, which have bars or ribs  
 “ enclosed or fixed on the top, or by a chain made of links similar  
 “ to the spring box of a watch, but multiplied in the width to  
 “ any dimensions required ;” or the same results are obtained by  
 “ substituting for the said flaps or chain an endless band of india  
 “ rubber, or any flexible or pliable material, so put on the rollers  
 “ that as one roller covers one part the other will be open, and so  
 “ on continuously.”

[Printed, 10d.]

A.D. 1854, May 2.—N° 984.

NEWTON, WILLIAM EDWARD (*a communication*).—“ Improve-  
 “ ments in moulding, preparing, and finishing articles and fabrics  
 “ made of compounds of caoutchouc, gutta percha, and other sub-  
 “ stances.”—*This invention is void by reason of the patentee having  
 neglected to file a Specification in pursuance of the conditions of the  
 Letters Patent.*—It consists as follows :—“ The sheets or masses  
 “ of caoutchouc or other material are first softened with naphtha,  
 “ spirits of turpentine, or other solvent, and then pressed into forms  
 “ or moulds, in which is placed tin or other metal foil of about the

464 INDIA RUBBER AND GUTTA PERCHA:

" substance of writing paper; the foil is pressed into the mould  
 " with the india rubber or other material, and is taken out of the  
 " mould with the article which is formed therein by pressure or  
 " otherwise. The foil is left upon the article, which is then  
 " submitted to the second process, viz., that of curing or pre-  
 " paring and finishing. For this purpose the articles are heated  
 " in any convenient and suitable manner to a temperature of  
 " about 300° Fahrenheit, during which process the foil will  
 " prevent the article from getting out of shape, and when the  
 " process is finished the foil may be easily removed from the  
 " article." "For flexible articles and fabrics no foil will be  
 " required, and it will only be necessary to submit the articles to  
 " the finishing process." "For dark articles or fabrics they may  
 " be dipped in a hot bath of nitro-muriatic acid for about half a  
 " minute, after which they are immersed in an alkaline solution  
 " to neutralize the acid." "This process will affect the color,  
 " and therefore if the articles be of a light color," "expose them  
 " to the action of chlorine gas for about half an hour, after which  
 " they will be found quite prepared and finished."

[Printed, 3d.]

A.D. 1854, May 2.—N° 987.

DIE, GUILLAUME.—"Certain improvements in the manufacture  
 " of tracing cloths and tracing paper."—*This invention received  
 provisional protection, but notice to proceed with the application for  
 Letters Patent was not given within the time prescribed by the  
 Act.*—It consists as follows:—Callendering the material, then  
 immersing it in a "solution of lichen, starch, and alum, and  
 " afterwards passing it through a compound consisting of lavender  
 " essence, gum copal, spermacetti, stearine, boiled linseed or  
 " siccativ oil, Venetian turpentine, solution of gutta percha in  
 " carbonic essence, litharge, common turpentine, carbonate of  
 " soda in certain proportions, and callendering again."

[Printed, 3d.]

A.D. 1854, May 4.—N° 999.

BARLOW, EDWARD, JOHNSON, WILLIAM, SLATER,  
 WILLIAM, and KNOWLES, PETER.—"Improvements in ma-  
 " chinery for preparing and spinning cotton and other fibrous



"materials." These improvements are said to be eight in number, and of these there are four relating to this subject. And first, "in the application to the machinery for spinning, called 'Potter's self-acting mules,' of an elastic substance between the drawing-up crank and the snail on the winding-on shaft, for the purpose of avoiding the shock or jerk which otherwise would be given to the parts." This is "a thick washer of vulcanized india rubber, or any other suitable elastic material, contained in a box to prevent it expanding."

Second, "in the application to such self-acting mules, as are worked by a quadrant, or radial arm, or expanding cone, or expanding snail," of an elastic substance as above, "between the winding-on drum or snail and such quadrant or other part."

Third, "in the application to such mules as are worked by drawing-up scrolls" of an elastic substance as above, "between the said scroll and the carriage."

Fourth, "in the application to such self-acting mules as are worked by a mangle wheel and rack of an elastic substance between the rack and the carriage." In this instance a buffer of elastic material "is placed between the end of the rack and the carriage to prevent the shock that would otherwise be imparted to the carriage when the mangle wheel reverses the direction of motion."

[Printed, 1s. 3d.]

A.D. 1854, May 6.—N<sup>o</sup> 1019.

WALLER, RICHARD.—"Improvements in engines and apparatus, and means of obtaining motive power from liquids, vapours, gases, or air, parts of which invention may be applied also to ordinary steam or other engines." These are, "obtaining motive power from highly elastic and condensible or permanent gases by means of apparatus constructed and arranged as described, or any modification thereof," &c. In these apparatus various modes "of packing either for stationary or moving parts of machinery" are described; the packing may be "made of metal, leather, vulcanized india rubber, gutta percha," &c.

Another arrangement "for obtaining motive power, consists of two discs with projecting flanges, similar in shape to a common dinner plate, with a flexible piston or diaphragm inside the full

“ supporting and guiding the rope at the points where tow lines  
“ are attached to it, and elsewhere, which trucks or waggons are  
“ to run on a suitable railway or tramway formed alongside of the  
“ canal.”

[Printed, 3d.]

A.D. 1854, May 10.—N° 1039.

FULLER, WILLIAM COLES.—“ Certain improvements in the  
adaptation of indian-rubber springs.” These consist “ in the  
“ adaptation of a ring or series of rings combined with suitable  
“ iron work or other metal, so as to form a powerful spring for  
“ various purposes connected with shipping,” for the purpose of  
giving a slight degree of elasticity, and prevent the sudden  
strain, such spring being combined “ with an anchor, shackle,  
“ or any other part of a cable, or with a hook or eye, or any  
“ part of a vessel where ropes or chains are affixed, and slight  
“ elastic action is desirable.”

[Printed, 10d.]

A.D. 1854, May 11.—N° 1047.

MILES, EZRA.—“ An improved coupling joint or connexion for  
“ tubing or other purposes.”—*This invention received provisional  
protection, but notice to proceed with the application for Letters  
Patent was not given within the time prescribed by the Act.*—It consists  
“ of a hollow metal cylinder, the internal diameter of which  
“ is contracted at a short distance from the mouth, similar to the  
“ ordinary socket pipe. Near the end of the pipe, which is to  
“ be connected with the cylinder, is cast a boss or shoulder, which  
“ is turned to fit the coupling cylinder, and the outer portion or  
“ end of the pipe beyond the shoulder is made of a conical form,  
“ terminating in a collar or flange; this part of the pipe enters  
“ the contracted portion of the cylinder. Upon the conical end  
“ of the pipe is placed a thick ring of vulcanized india rubber,  
“ somewhat larger than the diameter of the smaller part of the  
“ cylinder. A hole is made through the socket of the cylinder,  
“ and through a solid part left in the shoulder of the pipe for  
“ that purpose, in which is fitted a pin. When the end of the  
“ pipe is pushed into the cylinder, the elastic ring is forced  
“ towards the base of the cone, and tightly compressed against the  
“ sides of the coupling cylinder; the pin is passed through the

468 INDIA RUBBER AND GUTTA PERCHA :

“ cylinder and pipe, which holds the two firmly together.” “As the internal pressure on the joint is increased, it forces the elastic ring back on the enlarged portion of the cone, rendering the joint tighter as the pressure is augmented,” &c.

[Printed, 3d.]

A.D. 1854, May 12.—N° 1063.

AUBUSSON, CHARLES WILLIAM FEUILLADE. — “An improvement in ferrules.”—This consists in applying to these articles “vulcanized india rubber at the lower end thereof” to prevent noise arising from their use. These ferrules may be used “for walking sticks, umbrellas, crutches, wooden legs,” &c., and “heels of boots and shoes.” The ferrule is turned inwards at the bottom, so as to form a flanch; resting upon this, in the interior, is a ring of gutta percha or gutta percha mixed with india rubber or other material, through which the india-rubber is partly passed, and in such manner that the vulcanized india rubber may be securely girt in by this ring and the flanch.” In order thus to girt in the vulcanized india rubber, it is stretched or extended, and the stretched part bound round with thread or twine, so as to retain it in its extended-form, and thus admit of part being readily passed through the ring or collar,” and through the open end of the ferrule,” “on removing the binding thread or twine the vulcanized india rubber will contract in length and expand or resume its original form, where it is not confined by the collar or ring, and in the flanch of the ferrule;” “it is desirable” to dust over the interior of the ferrule, and also that part of the india rubber which comes within the ferrule, with the dust of rosin, before introducing the india rubber into the ferrule; such matter adds to the difficulty of withdrawing the india rubber.”

[Printed, 5d.]

A.D. 1854, May 18.—N° 1110.

JOHNSON, JOHN HENRY (*a communication from Meinrad Theilar*).—“Improvements in printing telegraphs.” These relate to “an improved construction and arrangement of mechanism for transmitting and printing dispatches or messages by electro-magnetic agency, and consist in the employment of wheels situated at each of the corresponding stations, which wheels are

“caused to revolve at the same speed ; a series of keys with the requisite letters or characters marked thereon are employed for conveying the intelligence.” “The apparatus for breaking and establishing the circuit of the current consists of an escapement wheel driven by clock-work, and insulated at the part connected with its carrying shaft. The printing mechanism is actuated by clock-work, and an escapement wheel similar to the telegraph, and driven at the same speed also.” “The wheel containing the signs or characters in relief is carried on the same arbor as the escapement wheel ; it is kept in contact with an inking roller, which is made hollow, and carries the color inside.” “The surface of the roller is covered with gutta percha, which is pierced with a number of very small holes, to allow the color to ooze out.”

See “Abridgments of Specifications on Electricity, Magnetism,” &c.

[Printed, 1s. 6d.]

A.D. 1854, May 23.—N° 1155.

JOHNSON, WILLIAM (*a communication*).—“Improvements in the treatment of organic matters, and in the application of the products thereof.”—*This invention did not proceed, the law officer having refused provisional protection.*—It relates “to the obtaining and manufacture of various useful products, more particularly of the caoutchouc and gutta-percha class, &c. “Gluten, fibrine, lignine, gelatine, albumen, caseine, and gum dextrine,” and other organic compounds, are to be treated with “cholic, tannic, gallic, mimotannic, and generally similar acids.” “Such new compounds may be used for all or most of the purposes for which gutta percha and caoutchouc can be employed ; they can also be vulcanized, and may be mixed with caoutchouc and gutta percha.”

[Printed, 3d.]

A.D. 1854, May 25.—N° 1162.

ASTON, EDWARD ONSLOW and GERMAINE, GEORGE.—“Improvements in mariners’ compasses to counteract the effects of local attraction.”—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—The object is

470 INDIA RUBBER AND GUTTA PERCHA:

"to neutralize or counteract the effects of the local attraction of iron, particularly of iron vessels; and also of electricity, by peculiar arrangements of electrics and non-electrics surrounding compasses," which "produce the desired result." This is effected as follows:—Three or more basins, which may be of copper, are suspended within each other "with equal spaces of from one to four inches or thereabouts at the bottom and sides, and the rim of each bowl rising to a level at the top;" each basin is closed by a plate "soldered or otherwise secured." The spaces between the basin "may be filled with any fusible non-electric substances, as gutta percha, resin, fats, oils, or preparations of these or the like, poured in a melted state into the innermost and outermost cells or spaces, while the centre space may be rendered vacuum by means of an air pump or other suitable means." "The open top of the centre basin, within which the compass is suspended on its gimbals, may be closed by a thick circular glass set in a screw ring frame."

[Printed, 3d.]

A.D. 1854, May 29.—N<sup>o</sup> 1185.

KRAUT, HENRY.—"Certain apparatus applicable to cocks, taps, and valves." These are applying "of tubes of vulcanized or otherwise prepared india rubber to apparatus for opening and closing taps, cocks, valves, pipes, or other channels through which water or gas," &c. have to pass, "the said india rubber tube acting as a stuffing box, spring, and valve, or stuffing box and spring only, or only as stuffing box; the latter, when applied to piston rods of pumps, &c." An india rubber tube is made enlarged at one end and closed at the same end; this tube is passed over a rod having a round bulb at one end. "The rod with the tube is introduced into the top by passing the rod end upwards, and as the bore of the tap is contracted to a smaller diameter than the enlarged end of the tube," "the latter will rest upon it," and the opposite end of the tube with the rod passes through the neck of the tap. A nob is slipped over the rod and the tube expanded over it, until it draws the enlarged end of the tube or bulb "tightly upon the contraction or valve seating," &c. When liquid is to be drawn the rod is pushed down, which removes the bulb from the seating, allowing the liquid to pass.

[Printed, 9d.]

A.D. 1854, May 30.—N° 1192.

MORDAN, FRANCIS (*a communication*).—"An improved ink-stand."—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—First, it consists in establishing, by means of a cock, a communication at will between "the interior of the inkstand and the atmosphere, through a small channel which crosses the tube, to which is adapted the key of the cock." Second, "In the adaptation to the cock of a fixed or moveable air pump, either sucking or forcing, constructed of a small ball of caoutchouc perforated with many holes."

[Printed, 5*d.*]

A.D. 1854, May 30.—N° 1199.

WERTHEIMBER, LEOPOLD.—"Improvements in apparatus for preventing sea sickness." Among these improvements relating to the above is, attaching elastic apparatus to each foot, as follows:—"Two oblong pieces of leather, wood, or other material," "are connected together by a piece of india rubber or other air-tight material, so as to form an air-tight chamber; in the side of the chamber is fitted a tube communicating with another reservoir or chamber, which may be attached to the leg," &c. Another modification of the above apparatus consists in making the sandals of pieces of india-rubber tubing or strips of india rubber, placed either vertically or horizontally, so as to obtain great elasticity." Another arrangement consists "of two oval rings or frames of steel; these are supported one above the other by metal rods, which keep them a certain distance apart; the rings are of sufficient size to allow the foot to sink within them. Inside the upper ring is a sole, to which is secured india-rubber rings or straps, which are also fastened to the lower ring; the india-rubber rings pass over rollers attached to the upper metal ring. The same arrangement of rings may be supported by rods jointed in the middle with pieces of india rubber."

[Printed, 4*d.*]

A.D. 1854, June 5.—N° 1251.

SPILLER, THOMAS.—"Improvements in propelling carriages when atmospheric air is used."—*This invention received provisional protection, but notice to proceed with the application for*

## 472 INDIA RUBBER AND GUTTA PERCHA:

*Letters Patent was not given within the time prescribed by the Act.*  
 —It consists of a “combination of apparatus to collect and  
 “condense atmospheric air into a suitable vessel by the movement  
 “of a locomotive carriage, and the using of such condensed air,  
 “when heated, as a means of obtaining power, by causing it to  
 “act on the piston or pistons of an engine.” For this purpose  
 “a fan or wheel, with vanes or blades of comparatively large  
 “diameter, is employed to give motion to an axis, on which are  
 “fixed eccentrics or apparatus to give motion to pump rods, and  
 “each of the pumps communicates with a chamber with a trumpet  
 “or enlarged mouth.” “By these means air is collected into  
 “the chamber with the enlarged or trumpet mouth by the pro-  
 “gress of the carriage, and the fan or wheel with vanes is put in  
 “motion by the force of the air, against which the vanes are  
 “pressed by the movement of the carriage.” “The air is by the  
 “pumps forced into the receiver,” which in preference is lined  
 “with a gutta-percha or other air-tight flexible bag or vessel,  
 “which is pressed on to the degree desired. The condensed air  
 “from the receiving vessel is by a pipe conducted to a heating  
 “apparatus, and thence it passes to the engine to act on the  
 “piston or pistons.” “The engine is enclosed in a chamber,  
 “which is kept heated by a fire, and the heated air, after having  
 “acted on the piston or pistons, passes from the engine to the  
 “fire, so as to aid in keeping up a good combustion of the  
 “fuel.”

[Printed, 3d.]

A.D. 1854, June 5.—N° 1252.

ALISON, SOMERVILLE SCOTT.—“The manufacture of a new  
 “material to be used for external applications in medicine,”  
 “consisting of “The skin of the lamb or other animal, deprived of  
 “wool or other fibrous matters, and prepared according to the  
 “process called chamois curing; then re-dressed, and afterwards  
 “rendered impermeable to air and water on one surface by the  
 “application of caoutchouc or other similar adhesive matter, or  
 “simply perforated.” “The lambskin absorbs a large quantity  
 “of liquid, is very retentive, and when wet becomes soft, pulpy,  
 “and adhesive, and a good conductor of heat.” “The perforations  
 “admit of the escape of vapour, and consequently the heat of  
 “the part to which the application is made is reduced,” &c.

[Printed, 4d.]

A.D. 1854, June 12.—N° 1289.

**BROOMAN, RICHARD ARCHIBALD** (*a communication*).—"A method of producing plans in relieve."—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—"These plans are formed of two sheets of caoutchouc, or other analogous material, rendered adhesive at the edges only, with here and there parts or points covered with silk, stuff, or other similar material, to represent objects in relief." "The objects required are made to appear in relief by blowing in air between the sheets of caoutchouc, the edges of which must then be hermetically closed."

[Printed, 3d.]

A.D. 1854, June 16.—N° 1308.

**COOKE, WILLIAM**.—"Improvements in boots and shoes."—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It proposes to attach portions "of a second sole to such parts of the original as are now liable to wear; this second sole, or portions thereof constituting a portable application, can be put on boots and shoes, either already made or to be manufactured, and by means of a cement already applied to the substance, or separately used, or by nails or screws. It is proposed to employ for the above object either leather, gutta percha, india rubber, or such other material as may suggest itself as best adapted to the above purpose."

[Printed, 3d.]

A.D. 1854, June 16.—N° 1311.

**MARTINI, FREDERIC**.—"A new and improved construction of steam engines."—*This invention is void by reason of the patentee having neglected to file a Specification in pursuance of the conditions of the Letters Patent.*—It consists of an engine which "has neither cylinder nor piston." It is formed by cementing together two discs of iron or steel plate which have been hammered so that, when united, they form a chamber which increases when the centres are drawn outwards from each other. The steam enters



474 INDIA RUBBER AND GUTTA PERCHA:

into this chamber, and the moving out and in of these discs gives the power to be employed. The exhaust steam passes out through a tube "directly instead of getting out by a roundabout way." "This tube is made of strong wire and covered with vulcanized "caoutchouc."

[Printed, 2d.]

A.D. 1854, June 19.—N<sup>o</sup> 1338.

BOGUE, DAVID (*a communication*).—"An improved apparatus "for facilitating the attachment of adhesive stamps." "The "envelope, letter, or other document is damped by a moist "sponge contained in a tray, and the damped surface is then "brought into contact with the gummed back of the uppermost "one of a pile of stamps, and the stamp is thus made to adhere "to the letter." "To secure the adhesion of the stamp to the "letter, the stamp is placed on an elastic cushion covered with "india rubber, and the pressure of the fingers being applied "thereto complete contact is obtained." "The stamps or labels, "when cut up, are arranged in a pile and placed in a box, the "sides of which are formed of four vertical plates, hinged to "a fixed bottom plate." "These hinged plates are kept in a "vertical position by means of bow springs affixed to the bottom "of the box yielding when pressed upon vertically by the descent "of the damped paper, while being brought into contact with the "pile of stamps contained therein."

[Printed, 6d.]

A.D. 1854, June 20.—N<sup>o</sup> 1348.

MONZANI, WILLOUGHBY THEOBALD.—"An improvement in "brushes and brooms."—*This invention is void by reason of the patentee having neglected to file a Specification in pursuance of the conditions of the Letters Patent.*—It proposes to attach vulcanized india rubber "as an elastic material on those parts of brushes and "brooms which in use are liable to be moved or struck against skirtings and other parts of buildings and places or things which are "to be dusted or cleansed thereby. By which application of vulcanized india rubber, noise will be prevented in the use of such "brushes and brooms, and the skirtings and other parts of

“ buildings, places, or things will not be injured by the hard parts of brushes and brooms as heretofore.”

[Printed, 3d.]

A.D. 1854, June 20.—N° 1352.

McLAINE, ALEXANDER.—“ An improved mode of constructing and fitting gun boats.”—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—In carrying out this invention a cannon of large calibre is mounted in the middle of the upper deck “ in fixed bearings, held down by bolts;” and “ the brasses of these bearings ” are packed “ at their rear and under side with vulcanized india rubber or other elastic yielding material for the purpose of breaking the force of the recoil,” &c. “ The sides of the vessel (above the water line), and any portions of the deck not required to be exposed,” is rendered bomb-proof by covering the same with bulks of timber or compressed cotton “ overlaid “ with vulcanized india rubber,” and the whole covered “ with plate iron.”

[Printed, 3d.]

A.D. 1854, June 21.—N° 1361.

NEWTON, WILLIAM EDWARD (*a communication*).—“ Improve-ments in apparatus for generating and utilizing steam;” these are, first, “ Expediting the generation of steam in tubular boilers,” the main object being to render steam power available for fire-engines.” Second, in “ an engine or pump which may be used in connection ” with the “ steam generator.” In the steam generator “ the water space is formed of a serpentine tube, which increases in capacity from the inlet to the outlet end, where it is connected with the steam chamber.” “ This increased capacity is obtained by constructing the tube of a trumpet form, or gradually increasing diameter, or of portions of different diameters, but each of equal bore throughout, which tubes must be so arranged that the diameter of the water space shall increase towards the exit passage, or the like effect is obtained by constructing the coiled pipe with branches, from which in turn other branches proceed.” “ At the points where the branches commence division plates are set within the pipe

476 INDIA RUBBER AND GUTTA PERCHA:

“ for causing the water or steam to ascend in equal proportions, or nearly so, to each branch. Water is fed to this serpentine tube by a force pump, actuated by the engine which the boiler is intended to supply with steam, the pistons of the engine and the pump being on the same rod. The traverse motion of this piston rod is employed to set a rocking lever in motion, one end of which is linked to a slotted rod, which slides in guides, and is intended to work the valve of the engine.” “ On the axle of the valve, which is by preference conical, a weighted lever is mounted loosely, and on the end face of the valve projections formed for the lever to strike against, and thereby rock the valve in its seat. The lower end of this lever projects through the slotted rod, which is actuated by the piston rod. By the traverse, therefore, of this rod the weighted lever is thrown either to the right or left, and the steam way is either opened or closed by the rocking of the valve.” “ This arrangement permits of the valve remaining stationary until the piston is at the point of finishing the stroke, and of then instantly opening up a passage for the exit of the exhaust steam and the inlet of steam to the other side of the piston.” “ Elastic check pieces of vulcanized india rubber are provided to receive the falling lever,” and “ to prevent any rebound, a second weight is jointed to the upper end of the lever, which weight will fall over as the lever attains its lowest position.”

[Printed, 2s. 4d.]

A.D. 1854, June 22.—N<sup>o</sup> 1366.

STIDOLPH, WILLIAM.—“ A transferable book-marker.”—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists “ of a method or methods of constructing a book-marker, and of combining the same with a paper-cutter;” to construct a book-marker “ take a narrow flat piece of metal, or any suitable elastic material, such as horn or the hardened vulcanized india rubber manufactured and patented by Charles Goodyear;” “ bend this narrow slip of metal or elastic material double, so as to form a spring, which is intended to clasp the cover, back, or leaves of a book.” At the bend of this spring “ attach one or more ribbons or strings, which are used as book-markers between the leaves, in the same manner as

“ the strings or ribbons usually attached to the backs of prayer books or bibles.” The advantage of this consists “in the means of transferring the marking ribbons or strings to different books, they being held only by the elastic spring before mentioned, as being loosely attached by the said spring to any convenient part of the cover, back, or leaves of the book; by elongating one of the blades of the spring, and making it sufficiently strong, a paper-cutter is formed.”

[Printed, 3d.]

A.D. 1854, June 22.—N<sup>o</sup> 1367.

YATES, THOMAS CHADWICK.—“ Improvements in wickets for the game of cricket.”—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists in “ connecting the three stumps forming part of the wicket to a cast iron or other stand by means of springs of vulcanized india rubber or other suitable material, in such wise that when the stand is fixed in the ground, and the stumps are struck by the cricket ball or otherwise, they regain their perpendicular positions. The bales or cross pieces forming the upper part of the wicket are required as before, but they are attached to the stumps by a band of india rubber or other material.” The object is “to save the time and labor required to replace the stumps in the ground after they have been struck down, and to ensure a uniform distance between the stumps; also to prevent the bales being thrown to the ground.”

[Printed, 3d.]

A.D. 1854, June 22.—N<sup>o</sup> 1369.

BLASHFIELD, JOHN MARRIOTT.—“ Improvements in the manufacture of china, pottery, bricks, and other articles manufactured for the most part of clay.” These are “the use of minerals or fossils containing phosphate of lime, and known in commerce as ‘coprolites,’ ‘phosphorites,’ ‘fossil sponges,’ ‘fossil foeces,’ ‘fossil flesh,’ and ‘fossil bones,’ which are said to be the remains of extinct animals, in the place of burnt bones.” They are to be washed in a “cylindrical wash mill,” the cylinder in preference “to be made of gutta percha,” “and

“ then dried, ground,” &c. It is stated “ that heretofore it has  
 “ been found practically impossible to mould articles of any size  
 “ from dry materials by pressure between dies, (that is to say, by  
 “ the process generally known as ‘Prosser’s Patent Process,’)  
 “ when the materials contain bone ash, in consequence of the  
 “ articles so moulded warping and twisting in burning; but if,  
 “ in place of adding bone ash, the requisite phosphate of lime  
 “ is supplied to the mixture in the fossil state, articles formed  
 “ from it will burn (if the ordinary precautions are taken) without  
 “ warping or twisting.”

[Printed, 4*l*.]

A.D. 1854, June 27.—N° 1414.

SHIPLEY, SAMUEL SMITH.—“ Improvements in fittings suit-  
 “ able for dressing cases, and for other purposes of elegance and  
 “ utility.”—*This invention did not proceed to the Great Seal.*—  
 It consists as follows, fitting to the bottom end of a tube or  
 case employed in carrying brushes, pomades, confections, &c.  
 with a cap or cover similar to those already in use for the top of  
 such tubes or cases. These covers may be “ of metal stamped  
 “ or pressed into a suitable form, or of glass.” These caps  
 should be lined with india rubber, or some such material, or “ with  
 “ a disc of vulcanized india rubber secured to the inside of the  
 “ cover.” “ Instead of a plain and simple disc of metal or other

“ aerated waters.” These are, first, employing “ an internal chamber made at the bottom of the apparatus, provided with a filter and moveable ball.” Into this internal chamber the powders for generating the gas are introduced. Second, “ the application of india-rubber rings to the stopper,” placed in the bottom of the internal chamber, after the powders are introduced, also to a tube forming part of a syphon, and to the cap of a piston, “ in order to stop perfectly the channel of the syphon,” &c.

[Printed, 9d.]

A.D. 1854, June 29.—N<sup>o</sup> 1429.

MARKLAND, THOMAS.—“ Certain improvements in machinery or apparatus for warping, dressing, and weaving textile materials;” these are, first, in “ warping, dressing, or weaving textile materials,” employing “ an expanding or contracting wraith or reed ” constructed as follows:—“ Perforate small holes in two strips or bands, in preference of vulcanized india rubber; but in particular instances one band or strip is sufficient; one band employ as a top, the other as the bottom support of the wires or dents, which constitute the reed; these wires insert at each end into the holes already pierced in the two elastic bands,” “ and then mount them in a frame, having at each end a vertical shaft, round which and fixed to it pass two strips of any suitable material in connexion with the india rubber bands. At the upper end of each vertical shaft is a small worm pinion, working in its respective right and left handed worm; these worms are carried on a longitudinal rod running the entire length of the ” reed, “ and are worked by hand at pleasure. The contraction of the bands of india rubber limit the greatest quantity of wires in a given space, and, by turning the longitudinal bar, the vertical shafts are caused to revolve, and, by winding on the bands in connexion with the india rubber, give to it a proportionate tension, and consequently widen the space between each wire.” Second, this applies only to the operation of weaving, and consists “ in a novel and peculiar construction of self-acting ‘ temple.’ The ‘ temple ’ is for the purpose of keeping the cloth distended whilst being woven, one being fixed on each side of the loom, so as to act on each selvage of the cloth.”

[Printed, 10d.]

A.D. 1854, June 30.—N° 1438.

McGAFFIN, JOHN.—“Improvements in the manufacture of iron casks and cisterns;” these consist, in “forming iron casks or cisterns, by combining corrugated iron, either galvanized or not, with frames or rims of cast iron.” “The joint between the rims and cylinders, and between the heads and the internal flanges, may be rendered fluid-tight by introducing packings of india rubber or other suitable packing, or in some cases the galvanizing of the casks or tanks may be performed after the parts are put together.”

[Printed, 3*l*.]

A.D. 1854, July 1.—N° 1445.

JOHNSON, JOHN HENRY.—“Improvements in stoppers for bottles and other vessels, and in apparatus connected therewith.”—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists “in casting or moulding stoppers of gutta percha, or of gutta percha incorporated with cork or wood powder.” “When in the mould, and before cooling, a metal screw is inserted in the top of the stopper, whereby it may be easily withdrawn from a bottle by inserting a corresponding screw therein. In place of a screw thread, a groove or projecting ring may be formed round the edge of the stopper, or a horizontal hole or recess formed in each side, to admit of the claws of a suitably formed cork drawer; or the stopper may be made entirely plain, and may be either solid or hollow, as found desirable.” “These stoppers are capable of being colored by the admixture of vegetable powders with the gutta percha.” “If great elasticity is required, a certain amount of caoutchouc is added to the gutta percha; and if, on the other hand, the stoppers are required hard and capable of standing heat well, a certain amount of shell-lac is mixed with the gutta percha.” “The stoppers may be pierced longitudinally, with a number of small holes running nearly through them, thereby affording greater elasticity to the same. These stoppers may be covered externally with cork or caoutchouc.” “The interior of large stoppers or bungs are filled up with wood or other suitable material, which is coated

**AIR, FIRE, AND WATER PROOFING. 481**

“ over or covered externally with gutta percha or caoutchouc, or  
 “ both combined. Ordinary corks may also be thus coated, or a  
 “ capsule of gutta percha fitted thereto in conjunction with  
 “ metallic tops,” &c.

[Printed, 3d.]

A.D. 1854, July 3.—N° 1450.

**FONTAINEMOREAU, PETER ARMAND LE COMTE DE** (*a communication*).—“ Improvements in stopping bottles, and in  
 “ drawing off aerated or other liquids contained therein.” “ The  
 “ neck of the bottle, which may be made of glass or stone, and of  
 “ any desired form, is provided with two projecting fillets slightly  
 “ apart from each other.” In the space between the two fillets  
 “ is placed a threaded ferrule or ring formed of two parts,” the  
 threads corresponding exactly with each other. “ The ferrule may  
 “ be attached by means of cement or plaster employed in a cold  
 “ state.” “ A capsule is screwed on the ferrule, the bottom of  
 “ the capsule being furnished with a washer of cork, leather,  
 “ caoutchouc, or gutta percha, &c.” “ The capsule may be com-  
 “ posed of two parts; the threaded piece, and the bottom which  
 “ goes inside.” “ For adapting the syphon for drawing off or  
 “ decanting the liquids, it is screwed to the bottom of the capsule,  
 “ which is provided with a thread,” “ or the capsule may form  
 “ part of the syphon,” &c., &c.

[Printed, 1s.]

A.D. 1854, July 3.—N° 1455.

**GUICHARD, EDOUARD AUGUSTE DESIRÉ**.—“ Improvements  
 “ in ornamenting the surfaces of various articles and fabrics.”  
 “ —*This invention received provisional protection, but notice*  
*to proceed with the application for Letters Patent was not given*  
*within the time prescribed by the Act.*—It consists in employing  
 as a flock “ to oil cloth, wood, paper, cardboard, or other sub-  
 “ stances,” “ and articles or fabrics composed wholly or par-  
 “ tially of caoutchouc or gutta percha,” “ sand, sawdust, or  
 “ powdered wood, pulverized leather, metals, and metallic salts,  
 “ talc or mica, bone, ivory, or horn reduced to powder, flax, hemp,  
 “ cotton, moss, lichen, or any textile plants, and generally all  
 “ substances, other than wool, capable of being reduced to powder,



482 INDIA RUBBER AND GUTTA PERCHA:

"whether animal, vegetable, or mineral, and either in their natural state, or dyed or stained. These substances may either be employed alone or in combination with various other matters, according to the effects desired to be produced; and they may be applied to the surfaces of the articles or fabrics, either by means of the ordinary flocking varnish, or by means of solutions of caoutchouc or gutta percha."

[Printed, 3d.]

A.D. 1854, July 4.—N° 1458.

STOCKER, ALEXANDER SOUTHWOOD.—"Certain improvements appertaining to match boxes, and in the fitting, stopping, and covering of tubes, and other vessels of glass, porcelain, and other materials." In these improvements one is said to be giving an enlarged or curved top or dome to the cap or cover for a tube or bottle," using "a cupped bolster and a plug of vulcanized india rubber; the india rubber being driven into the head of the cap causes it to expand and fill up a suitable enlargement in the die." Also, "with a view to prevent the injury to vesta and other matches from the effects of exposure to damp, as well as to securely prevent the escape of the phosphorescent fumes or effluvia arising from matches confined in such tubes or receptacles," "take a disc of cork, vulcanized or mineralized india rubber, or other suitable material, which is punched or cut to a proper diameter, and place it in the cap or cover, and, if necessary, attach it thereto by cement or otherwise."

[Printed, 10d.]

A.D. 1854, July 4.—N° 1462.

DELPECH, JEAN ANDRÉ CÉCILE NESTOR.—"An improved lift and force pump, called castraise pump," constructed as follows:—The barrel of the pump is "in two lengths, united in the middle by flanges and bolts and nuts. Between the flanges is placed a plate of metal, in which is fixed an inner barrel or cylinder, of smaller diameter and somewhat shorter than the first-mentioned or outer barrel. The outer barrel is thus divided by the central plate into two compartments or chambers, which communicate with the two ends of the inner barrel, in

“ which works a piston packed with cupped or dished pieces of  
 “ caoutchouc or leather, or other suitable material ; or the piston  
 “ may be made of a solid or hollow piece of caoutchouc ; or a  
 “ solid plunger working through a stuffing box, or elastic packing  
 “ may be employed in lieu of a piston. The pump is provided  
 “ with valve chambers, or a valve chamber divided into two parts,  
 “ and arranged so that the course of the water may be as direct  
 “ as possible. The valves are of a spherical form, and are con-  
 “ structed of an elastic material, so as to insure their fitting tight  
 “ on the seats. They may be of solid caoutchouc, or they may  
 “ consist of a hollow shell or casing of caoutchouc, leather, or  
 “ felt, or other elastic material, inclosing a ball of wood, or loaded  
 “ with shot or other materials. Guards or cages are applied  
 “ above the valves to prevent them from rising too high ; and  
 “ other guards or cages may be applied beneath them, in order to  
 “ prevent them from being forced through their seats, in the event  
 “ of their becoming greatly compressed and reduced in diameter  
 “ by the pressure of the water or other fluid which is to be raised  
 “ by the pump.” The passages for the fluid are arranged “ so as  
 “ to allow the air to escape on starting the pump, or a loaded  
 “ valve or valves are applied for that purpose.”

[Printed, 7d.]

A.D. 1854, July 6. —N° 1486.

RADCLIFFE, JOHN.—“ Certain improvements in power looms  
 “ for weaving.”—*This invention received provisional protection, but  
 notice to proceed with the application for Letters Patent was not  
 given within the time prescribed by the Act.*—It consists “ in the  
 “ application, employment, or use of elastic surfaces in certain  
 “ parts of power looms for the purpose of adjusting, regulating,  
 “ and softening the impulsive force or action of the ‘ picker,’ in  
 “ lieu of the ‘ check strap ’ or other contrivance hitherto employed ;  
 “ such elastic surfaces may be made of small pieces, or rings, or  
 “ washers, and placed upon either or both ends of the guide  
 “ spindle of the ‘ picker,’ or they may be attached to both sides  
 “ of the ears and foot also of the ‘ picker ’ itself, and thus form  
 “ an elastic exterior for the same. These elastic media act as  
 “ small ‘ buffers,’ and may be adjusted in thickness or strength,  
 “ and may be composed of caoutchouc, india rubber, or other  
 “ similar elastic substance, or other suitable contrivance.”

[Printed 3d.]

A.D. 1854, July 12.—N° 1520.

EASSIE, WILLIAM.—“Improvements in trucks used on rail-  
“ways.” These consist in “the prevention of the shock occa-  
“sioned by sudden starting or stoppage of railway and other  
“trucks, which may be connected by a draw pole or bar, for the  
“purpose of carrying timber and similar goods, and thereby  
“preventing to a much greater extent than at present the wear  
“and tear of the same,” by employing tubes “or casings of india  
“rubber placed vertically or otherwise at the points of fastening  
“the draw bar with the framing of the trucks.”

[Printed, 8d.]

A.D. 1854, July 12.--N° 1521.

HOUGHTON, WILLIAM, and HOYLE, ROBERT.—“Improve-  
“ments in machinery for spinning and doubling cotton and  
“other fibrous substances.” These are “applicable to self-acting  
“mules and other machines of a like nature,” and consist “in  
“certain improved combinations of machinery for throwing out  
“of gear the catch boxes, by which the drawing rollers are made  
“to revolve and the carriage made to run out for stopping the  
“spindles, for stripping the yarn off the bare part of the spindles,  
“for working the fallers, and for bringing the carriage up to the  
“roller beam ; also in modifications of the same for producing  
“after draught, for giving twist, and for backing off;” also “in  
“the application of an expanding pulley or drum supported in  
“the carriage for winding the yarn on the spindles. And in an  
“improved scavenger for cleaning the flyings or dust off the  
“roller beam and carriage top or either of them.” “Near each  
“end of the roller beam is supported a grooved pulley, to one of  
“which a slow revolving motion is given from the front drawing  
“roller or other convenient part of the machine.” A band passes  
“round the pulleys, and to this band are attached one or more  
“pieces of flannel or india rubber or other suitable material ; these  
“pieces hang down from the band, and in their passage along the  
“roller beam clean it from dust and flyings, and when the carriage  
“is near the roller beam, the top thereof is in like manner cleansed  
“by the lower piece which hangs down from the lower part of the  
“band.”

[Printed, 10d.]

A.D. 1854, July 12.—N<sup>o</sup> 1533.

GARDISSAL, CHARLES DURAND.—“A stamp safe.”—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It may consist of a box with “metallic or other rollers or spindles placed at the proper distance and capable of turning in the box, &c.” The stamps are wound on the different rollers. “To prevent the uncoiling of the stamps whilst the rollers are stationary,” the frictional contact of a spring or india-rubber band bearing against the circumference of the coiled sheet is employed. The feeding and delivering sides have doors or lids to lock with a key, “so as to preserve the stamps from being interfered with.”

[Printed, 3d.]

A.D. 1854, July 13.—N<sup>o</sup> 1537.

FOULKES, THOMAS BENNETT.—“Improvements in the manufacture of self-adjusting gloves.” These are “the use and employment of a gore of india rubber webbing or any other suitable elastic material, inserted at the wrist part of gloves, known to the trade as gauntlets.” A piece of a V shape is cut out of the gauntlet next to the palm of the hand, and a similar shaped piece is inserted in its place by sewing.

[Printed, 6d.]

A.D. 1854, July 13.—N<sup>o</sup> 1541.

HACKETT, JOHN.—“A new method of fastening the ends of india rubber elastic cord and india rubber elastic web.” “In order to fasten the ends of a loop for coat loops made of india rubber web,” “pass the web through the shank or shanks of the button or buttons, and then lay the two ends of the web together;” “then fasten them with a few stitches, and after having laid a bent bit of metal called a wrapper, in the mouth of a tag fastening machine, hold the loop on it on the stretch, and wrap the metal entirely round the two ends and sides thereof in the same way that a tag is wrapped round the end of a lace.” Modifications of this are described.

[Printed, 4d.]

A.D. 1854, July 15.—N° 1554.

BRINDLEY, ELIJAH HENRY.—“ Certain improvements in “ printing or ornamenting china, earthenware, and glass.” These are using “ flexible and elastic blocks or types ” for the above purposes, “ such blocks or types being capable of being adapted “ to the particular form of the surface to be printed.” This may be effected in different ways ; as an example, suitable models of the block or type are made in wax or clay, by pouring a mixture of melted bees’ wax and tallow into moulds “ of glazed earthenware “ or tin.” From these models moulds are made in plaster of Paris in the usual way, and dried thoroughly, and from these moulds “ a casting is taken in the composition required to produce “ a flexible and elastic block ; ” the composition is “ glue water and molasses in certain proportions.” “ The holder of the block or type is a piece of plaster of Paris, gutta percha, metal or earthenware,” &c., &c.

[Printed, 7d.]

A.D. 1854, July 18.—N° 1573.

HITCHINS, HENRY and BATLEY, WILLIAM.—“ Certain “ combinations of materials suitable for mouldings and medallions, “ and to be employed as a substitute for wood, gutta percha, and “ other like materials.”—*This invention received provisional pro-*

“ or to which is secured a bag or diaphragm of any suitable flexible material;” the said diaphragm “is secured in any convenient way to the inside of cylinder or prismatic tube or pipe, in which the piston or embolus is capable of performing a reciprocating motion, the same as ordinary pistons.” “One way of securing the diaphragm in the pipe or cylinder is by means of a projecting rim on it, the same being held fast between flanges on the pipe or cylinder, which latter is formed in two parts.” “The piston may be attached or secured steam-tight to the diaphragm in any suitable way, for instance, the diaphragm may be open at one end and have a bottom at the other, the same as a sack or bag, the said bottom being fixed or made to adhere to the top of the cylinder, or the cylinder may be fixed higher up in the bag at any suitable point according to the moving liquid or fluid used,” &c. “When the diaphragm piston is applied to steam engines, the use of india rubber cloth or web is suggested, this material not being corroded by the steam.”

[Printed, 6d.]

A.D. 1854, July 18.—N° 1580.

JOHNSON, WILLIAM BECKETT.—“Improvements in steam engines.” In these improvements one is said to be “the application to the metal lid of air and fuel pump valves, of a piece of vulcanized or other preparation of india rubber, which arrives in contact with a stop upon the opening of the valve. Also the application of vulcanized or other preparation of india rubber as a check or stop for preventing air and fuel pump valves from opening too far.” One end of the india rubber is “secured” by plates to the valve, “and the other to the valve lid,” &c.

[Printed, 7d.]

A.D. 1854, July 18.—N° 1582.

FONTAINEMOREAU, PETER ARMAND LE COMPTE DE (*a communication*).—“Improvements in zincography.”—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists as follows:—A roughened plate of zinc is drawn

488 INDIA RUBBER AND GUTTA PERCHA :

upon with lithographic ink; the plate is slightly heated, and resin &c., reduced to a fine powder is dusted upon it "through a fine silk sieve;" the powder is removed, so that the drawing alone is coated. The plate is heated sufficiently to soften the powder on the drawing, and convert it into a varnish, "while the rest of the plate (to form after the sunken parts) is attacked, by placing it in a weak solution of sulphate of zinc, in face of another plate of the same material and size, and the two are put in communication with the poles of a galvanic battery." "When the drawing is sufficiently bitten in, the plate is removed and cleansed. It may then be employed to print from directly, or to serve as matrix to a gutta-percha mould, on which copper is subsequently deposited, to form a picture according to the well-known galvano-plastic process."

[Printed, 3d.]

A.D. 1854, July 20.—N<sup>o</sup> 1593.

JACKSON, GEORGE.—"Certain improvements in the construction of tents."—*This invention did not proceed to the Great Seal.*—It consists "in producing a tent without a central support," &c. In doing this rafters or ribs are required, their top ends made to fit the mortices or openings in a central key block, "at such angles as the inclination requires, and to have a groove, scoop, dovetail, or other contrivance to receive the pressure of the outer ring or band. The binder or rim to attach the rafters or ribs to the central key block may be of vulcanized india rubber, or the same combined with metal, or with metallic springs and metal combined, or wholly of metal, the same to be in one piece, or made to fasten as a collar with screws, hooks, &c."

[Printed, 3d.]

A.D. 1854, July 20.—N<sup>o</sup> 1596.

HACKETT, JOHN.—"Covering india-rubber thread, whether vulcanized or otherwise, with sewing silk, and with other articles," by means of "a braid machine, such as is in general use;" or "by means of a machine that wraps the material round the india-rubber thread;" or "first cover the india-rubber thread with cotton, by means of a so-called covering machine," and afterwards "cover it with any of the above-

" named materials by means of a braid machine." " When two  
 " or more threads are to be covered to make a web, or what is  
 " termed a 'sandling,' cover them either with one or other of  
 " the above-named materials by means of a braid machine, such  
 " as is now used for covering braid or sandling, of the ordinary  
 " make;" or " to make the sandling web in the loom," " place  
 " two or more threads of any of the above-named materials be-  
 " tween every thread of india rubber, either bare or covered in the  
 " warp, and use as weft or shute" any other material. " In  
 " making gusset webs, or brace webs, or belt webs," " use the  
 " warp threads in a similar manner to that in which the warp  
 " threads are in the sandling webs when made in the loom." " In  
 " making frill or garter webs," " adopt the same method in the  
 " plain part as that adopted in the manufacture of brace and  
 " gusset webs, except as regards that part of the warp which is to  
 " make the frill, and this is made of any material" which is con-  
 sidered " most suitable."

[Printed, 3d.]

A.D. 1854, July 27.—N° 1659.

WICKENS, HENRY.—" Improvements in the means of giving  
 " signals on railways, and for other purposes." These are to  
 enable the guard or driver or other person in a train to communi-  
 cate by signals. " Two cylinders of metal, each having a piston  
 " properly packed," and arranged so that when " the power is  
 " applied to a lever handle attached to one of such cylinders, the  
 " piston connected therewith is raised, and by the pressure of air  
 " the inlet valve thereof is closed, and the outlet valve thereof  
 " opened, and the air is forced from such cylinder into a tube of  
 " communication;" and from thence by arrangements into the  
 hollow piston rod of the other cylinder to a whistle or instrument  
 connected therewith, and " which is thereby sounded." " For the  
 " purpose of drawing the piston back when the person who is  
 " using the signal ceases to act, and to maintain it in its proper  
 " position when at rest," india rubber or other suitable spring or  
 springs are " attached at one end to a cross head connected with  
 " the piston rod, and at the other to the frame to which the cylinder  
 " is fixed, or by other convenient means." " The whistle or other  
 " instrument at the other end or part of a train may also be  
 " sounded by means of wire, rope, cord, or other suitable mate-



“ rials carried along the carriages of the trains.” “ So that a  
 “ person wishing to give a signal may, by pulling or drawing the  
 “ line of communication, by means of a hand wheel or other con-  
 “ trivance, draw the piston in the cylinder at the other end or  
 “ part, and thereby force the air from the cylinder through the  
 “ whistle or other instrument, and give the signal by its sound.”  
 “ A spring or springs of india rubber or metal, sufficiently strong  
 “ to draw the piston and line of communication back again when  
 “ the person ceases to pull or draw such line, should be conve-  
 “ niently attached or connected with the piston or piston rod for  
 “ that purpose,” &c., &c.

[Printed, *4d.*]

A.D. 1854, July 28.—N<sup>o</sup> 1662.

SCOTT, GEORGE LAMB, and BENNETT, SAMUEL.—“ Improve-  
 “ ments in springs for pressing together rollers for mangling and  
 “ other purposes.”—*This invention received provisional protection,*  
*but notice to proceed with the application for Letters Patent was not*  
*given within the time prescribed by the Act.*—It consists “ in pro-  
 “ ducing the requisite pressure by means of springs of vulcanized  
 “ india rubber or other suitable elastic material;” by this means  
 “ the machinery is considerably simplified, and the cost thereof  
 “ diminished.”

A.D. 1854, July 29.—N° 1670.

KEEN, ROBERT JOHN.—“Improvements in the mariner’s compass.” These are, first, “in adapting a peculiar construction of india-rubber disc spring to the cap of the compass.” The pedestal on which the cap which sustains the compass card is supported is screwed and fixed in a socket at the bottom of the bowl of the compass. A cup of metal is screwed on to the top of the pedestal. On this cup is a disc of india rubber, secured to the cup by a ring over it, “the edges of the disc being furnished with washers of ivory or bone,” “cemented thereto in order to preserve the india rubber from the corrosive action to which it would be exposed by coming in contact with the metal” edges of the cup, and ring; “in the centre of the disc is an aperture, in which is fitted a cap,” “containing a jewel for the centre” “of the compass card to work in,” “a flat ring screws on at the back of the cap for the purpose of holding it in its place;” between which ring and the india-rubber disc are bone or ivory washers for a similar purpose as above, &c., &c. Second, “in adapting a double-action metallic spring to the centre on which the compass card is supported.” Third, “in adapting metal springs to the pivots and shoulders of the compass.”

See “Abridgments of Specifications upon Electricity, Magnetism,” &c.

[Printed, 9d.]

A.D. 1854, July 29.—N° 1678.

INGALL, GEORGE HENRY.—“Improvements in elastic bands for holding books and papers.”—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists “in forming bands for holding papers, &c., and which usually consist of vulcanized india rubber,” of elastic webbing or other suitable elastic material with a coupling piece, “by which the band may be united at its full size, or the ends overlapped and united to form a smaller band.” “The union may be effected by a flat metal hook and eyes attached to the webbing, or the eyes may be worked and sewn to the band. The hook may terminate the one end and a metal loop the other, through which the hook passes; other methods of

“ uniting may also be adopted with like effect. Instead of making  
 “ the band with ends it may be annular, and provided with the  
 “ means of over-lapping by hooking or otherwise.”

[Printed, *3d.*]

A.D. 1854, July 31.—N<sup>o</sup> 1687.

NEWTON, ALFRED VINCENT (*a communication*).—“ An im-  
 “ proved mode of extracting sulphur from compounds of india  
 “ rubber and sulphur.” In preference, the following is the mode  
 pursued:—The vulcanized rubber is reduced into as small pieces  
 as it can be, and steeped “ in camphine from two to fourteen  
 “ days,” depending on the nature of the compound; after this it  
 is put into a still with camphine, and heat applied for from three  
 quarters of an hour to two hours. As the camphine distils, a  
 fresh supply is kept up. “ With the camphine should also be put  
 “ from fifteen to twenty-five per cent. of sulphuric ether, and  
 “ about five per cent. of alcohol, to be gradually added as the  
 “ camphine is added.” “ After the sulphur has been extracted  
 “ and the gum restored to its natural condition (which is easily  
 “ recognized by workmen experienced in the working of india  
 “ rubber and allied gums, notwithstanding its soft state), it  
 “ is removed from the still, put into flat pans, and dried by  
 “ exposure to natural or a gentle artificial heat.” “ When thus

A.D. 1854, August 5.—N° 1719.

STANSBURY, CHARLES FREDERICK (*a communication from Robert Arthur*).—"Improved air-tight vessels." "Forming at or near the mouth of vessels" "a groove or gutter, into which the edge of the cover" may pass, "and placing in such groove any proper permanent fluid when the vessel has to be frequently opened, or any proper fusible composition or substance when the vessel is intended to be hermetically sealed or permanently air-tight." Also, "giving to such groove or gutter such a form as to prevent its contents from being spilled when the vessel is inverted." Finally, the cement described is claimed, and consists "of gutta percha and resin in various proportions."

[Printed, 7d.]

A.D. 1854, August 7.—N° 1725.

COX, GEORGE ADDISON.—"Improvements in machinery or apparatus for winding yarns or threads." These relate to various arrangements of machinery for the above purpose, as follows:—"The spindles for holding and driving the pirns, cops, or coils of yarn are made of iron or other suitable metal, and they are covered with leather, gutta percha, india rubber, or other frictional substance." "Each spindle is disposed in a horizontal direction, and is made to revolve by its frictional contact with the circumference of surface wheels carried on shafts or spindles, which are arranged horizontally and at right angles with the main or centre shaft of the machine, from which latter shaft they are driven." "When the pirn has been filled with yarn by the winding action, it stops automatically and without any extraneous attention." "This movement is produced by the pressure of the spindle end against a lever or spanner, which disengages a duly arranged catch and permits a pair of eccentrics or cams situated beneath the spindle to disengage the frictional surfaces, bringing the spindle clear of its driving discs or wheels." "Should a thread break during the winding action, or should it be necessary to stop any spindle for any other reason, a small thumb handle, projecting from the catch or stop, gives the attendant the necessary means of providing such stoppage." "This thumb handle requires but a very slight pressure to throw it off, and thus permit the eccentrics to lift the spindle clear off the driving disc or wheels."

“ The same lever or spanner which bears upon the spindle end  
 “ serves to afford power by means of a weight or spring for  
 “ effecting the hard or soft winding on of the yarn upon the  
 “ pirn.” “ An eccentric motion is also fitted up in connexion  
 “ with the driving gear of the machine, for the purpose of  
 “ increasing the velocity of the spiddle when the yarn is winding  
 “ on the small part of the pirn, thus imparting a uniform speed  
 “ to the take-off of the yarn from the reels or holders.” “ This  
 “ same eccentric motion gives a variable motion to the guides for  
 “ laying the yarn on the pirns.” There is also a weight attached  
 “ to the eccentric motion shaft for balancing the power required  
 “ for driving the machine.”

[Printed, 1s. 1d.]

A.D. 1854, August 8.—N<sup>o</sup> 1738.

CORVI, ANTOINE.—“ Improvements in musical instruments.”  
 These relate “ to a system of instruments so combined as to replace  
 “ orchestras by means of stringed and wind instruments which  
 “ are played like barrel or key board organs.” These instruments  
 comprise both stringed and wind. In stringed instruments the  
 fiddle bows are replaced “ by wheels having a tyre of india rubber  
 “ or other suitable material,” &c. In wind instruments “ for  
 “ obtaining the particular sound of the clarinets the mouthpieces  
 “ are placed into a perfectly closed chamber,” and a piece of

" ingredients have become dissolved by the bisulphate of carbon. ' Then take another bottle containing two ounces and a half of " bisulphate of carbon," to which add " one half of an ounce of " gutta percha, one eighth of an ounce of common resin, and one " eighth of an ounce of asphaltum." " These materials or ingre- " dients, being left to become dissolved by the bi-sulphate of " carbon, are afterwards mixed with the contents of the first " bottle." " The whole composition thus formed becomes ready " for use in the course of a few hours, sooner or later, according " to the state of the atmosphere at the time when it is made." " It should be kept in a bottle well corked."

[Printed, 3d.]

A.D. 1854, August 9.—N° 1746.

JOBARD, JEAN BAPTISTE AMBROISE MARCELIN.—" A new " system of pump." It may be described as follows:—A cylindrical box has in its interior an elliptical cylinder turning upon its axes by means of a crank or handle. An india-rubber tube enters the box, passes once round the elliptical cylinder, and out of the outer box at the opposite extremity from where it entered. The water enters one end of the tube and is pressed out at the other by turning the elliptical cylinder. A modification of the above arrangement is described. Another pump consists of " an archi- " median screw with one or more threads, which presses at the " same time a number of vertical tubes set round the interior of " a cylinder." A valve which is made use of in several ways is described; it consists of a tube into which a conical perforated tube is fitted and fastened at one end; a conical-shaped tube of india rubber fits into the interior of the perforated tube, and is fixed to it at the narrow end. Another valve is constructed in caoutchouc without the use of metal, consisting of " one or more slits made " longitudinally in a tube of caoutchouc, which slits open like lips " upon pressure being applied thereto, and shut after the passage " of fluids by closing one upon the other, like the natural extre- " mities called by anatomists ' meata,' " &c., &c.

[Printed, 6d.]

A.D. 1854, August 14.—N° 1767.

STONEHAM, JAMES TOLPOTT.—" Improvements in the " mode and method of rendering woven fabrics waterproof, and

496 INDIA RUBBER AND GUTTA PERCHA:

" in the substance or composition used for the purpose."—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists in making " a composition of " tar, oil, resin, bees' wax, and caoutchouc, or solvents of caoutchouc," and mixing the same " with any felted fibrous matter, " then putting the said mixture on the material to be water-proofed," " forcing it into the material by pressure with rollers, " similar to calendar rollers," or " apply the pressure in any of " the usual methods." " In some cases, especially with very low " kinds of fabrics, instead of the felted fibrous matter " " use " paper, the same width and length of the cloth or fabric to be " waterproofed, and use pressure in the same way " as when using " felted fibre."

[Printed, 3d.]

A.D. 1854, August 17.—N° 1799.

GRIFFITHS, ROBERT.—" An improvement in the manufacture " of brushes."—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists in " employing wires, set in india rubber or other suitable substance, as " when making cards for carding cotton and other fibres, and " supporting the wires with a surrounding edge of bristles, fibres " of the cocoa-nut, or other matters used in making brushes, by " which the middle or central portion of a brush will consist, or " for the most part consist, of wire."

[Printed, 3d.]

A.D. 1854, August 18.—N° 1807.

CLARKE, JOHN PRETTY.—"Improvements in the manufacture " of reels for reeling of cotton, linen, thread, silk, or other fibrous " material." These are, manufacturing the ends of reels (for cotton and linen thread) of wood, bone, hoof, horn, ivory, pearl, papier maché, pasteboard, gutta percha, leather, china, and glass, " with slots, holes, or passages through them, so " that the extent or diameters of the barrels and of the thread " wound thereon may be seen through the holes, slots, or passages formed through such ends." " By such means reels will

“ at once shew to the purchaser the extent to which reels are  
“ wound with thread.”

[Printed, 3d.]

A.D. 1854, August 18.—N° 1812.

FONTAINEMOREAU, PETER ARMAND LE COMTE DE (*a communication*).—“ Improvements in preserving corn and other dry  
“ seed.” These consist “ in the use of closed metallic chambers,  
“ serving as tubular granaries or receptacles for the seed.”  
“ These tubular granaries, which may be laid under ground, or  
“ partially or wholly above, consist of a metallic case, preferably  
“ constructed of sheet iron, covered outside with a coat of  
“ hydraulic or other cement, and, if necessary, with a coat of pre-  
“ servative varnish. When employed underground, the bottom  
“ of the trench or pit in which the chamber is placed is covered  
“ with hydraulic cement, or mortar of hydraulic lime, and, if  
“ damp, with a layer of bitumen, and on these rest the case of  
“ iron or other metal, before mentioned. Around this case a coat  
“ of bitumen or other waterproof substance should be applied, if  
“ the case be of thin sheet iron, to stop the joints. The casing is  
“ then surrounded with a bed of hydraulic or other cement,  
“ to prevent the oxidation of the iron, and also to withstand the  
“ weight and thrust (when a single chamber only is employed) of  
“ the surrounding soil. When several tubes of a cylindrical form  
“ are laid parallel and contiguous, the triangular interstices only  
“ are filled with the cement.” “ The chambers are closed with  
“ an iron lid or plug, with a pad of leather, caoutchouc, or gutta  
“ percha introduced between the parts in contact; and by an  
“ inner cover, adapted to the neck of the chamber, hermetically  
“ secured,” &c.

[Printed, 1s. 3d.]

A.D. 1854, August 18.—N° 1816.

KERSHAW, SAMUEL, and TAYLOR, JAMES.—“ Certain im-  
“ provements in carding engines.” These consist in the applica-  
“ tion “ of a comb or toothed or serrated edge or plate to the  
“ extremity or edge of what is well known and technically termed  
“ ‘ Bodmer’s feeding plate,’ in combination with the ‘ feed  
“ roller’ of the carding engine, having “ patent india rubber



“ medium is diaphragms of felt,” or such material, “ with interposed layers of charcoal or carbonaceous matter.” In filtering “ by ascension,” the filter takes the form of a necked vase or “ bottle,” and, among other things, it may be made of gutta percha. The bottom is perforated, and the water passes through diaphragms of felt, with layers of charcoal between. The neck has a tube, which may be flexible, “ to conduct the filtered liquid away for use.” Other modifications of the above are described.

[Printed, 3d.]

A.D. 1854, August 18.—N° 1819.

JOHNSON, WILLIAM (*a communication*)—“ Improvements in “ moulding or shaping articles of vulcanized caoutchouc.” These are in making snuff-boxes, knife handles, combs, or similar articles. “ The moulds are previously prepared by having their interior surfaces slightly coated with tallow or other similar fatty “ or oily matter.” “ When a sufficient quantity of material has “ been placed in the mould to give the required thickness to the “ article to be shaped, the mould is closed and placed in or under “ a powerful press.” “ The mould having been sufficiently “ pressed is removed from the press, and placed between two “ thick plates of red-hot iron, and the mould between these red-hot plates is then again introduced into the press, and the “ pressure is increased in proportion as the mould gets heated. “ When these red-hot plates have imparted sufficient heat to the “ mould, it is withdrawn from the press and plunged into cold “ water, and allowed to remain there until cool. The article is “ then taken out of the mould, perfectly shaped to the form and “ contour of the mould, and having a high degree of compactness, “ solidity, and polish.” “ To manufacture articles of variegated “ colours, veined, striped, or marbled, scraps or figures cut out of “ colored india-rubber are first introduced into the mould, or “ mineral colors or other colored substances may be employed, “ and the filings or waste scraps, to form the body of the article, “ are then introduced above them,” and other layers are introduced. “ It is proposed to apply this process of moulding to the “ joining or soldering of articles composed of hard vulcanized “ india rubber. For this purpose the broken parts are first “ scraped off, and dust or powder of hard vulcanized india rubber

500 INDIA RUBBER AND GUTTA PERCHA:

“ is introduced between the scraped surfaces. The whole is then  
“ submitted to a high degree of heat and pressure.”

[Printed, 3*l*.]

A.D. 1854, August 18.—N<sup>o</sup> 1820.

JOHNSON, WILLIAM (*a communication*).—“Improvements in  
“ the manufacture of hat bodies.”—*This invention is void by  
reason of the patentee having neglected to file a specification in  
pursuance of the conditions of the Letters Patent.*—It relates to  
applying and using “hard rubber” “in the manufacture of hat  
“ bodies.” The material, when soft, is moulded to the shape  
required, and vulcanized on the mould. The compound preferred  
is made up of two pounds of rubber to one pound of sulphur.  
“Sulphurized gutta percha may also be used for a similar  
“ purpose.”

[Printed, 3*l*.]

A.D. 1854, August 22.—N<sup>o</sup> 1846.

HANCOCK, JAMES LAMB.—“An improved pneumatic safety  
“ inkstand.” This consists “in forming an inkstand with an  
“ orifice in the reservoir for the ink covered by a diaphragm of  
“ air-tight, elastic, or loose material, preferring vulcanized india-  
“ rubber,” “capable, when depressed at the instant of taking a  
“ dip of ink of causing the air contained in such reservoir to

“sible material,” as follows :—“This bag is closed at one end by a fixed bottom of wood or any other suitable material, the opposite end being shut by a moveable lid. These top and bottom plates have one or both of them valves suitably adjusted, so as to let the liquid in and out, which it is desired to raise or set in motion. The moveable lid may be depressed or brought down upon the fixed bottom by any suitable mechanism, or by its own weight, so as to compress and fold the bag, and expel all or nearly all the air, an exit valve being applied to the moveable lids for that purpose. The moveable lid is then raised again, and by the reciprocating motion thus effected a vacuum, or partially so, is produced.” “This vacuum, in conjunction with the atmospheric or other pressure, is applied to pumping or exhausting any liquid or fluid matter;” and for this purpose, “in the lower or fixed bottom an inlet valve is placed” which “allows said fluids or liquids to rush in, but prevents them from returning back.” “The bag, taken in its transverse section, may have any shape, such as circular, square, &c.,” and in order to facilitate its motion, and allowing it to be compressed more easily, it is constructed in the manner of accordions, &c.,” and “surrounded internally and externally at suitable distances with hoops or rings of large and small diameters alternately; for instance, a hoop or large diameter inside the bag, and next another of small diameter outside next again.”

[Printed, 10d.]

A.D. 1854, August 25.—N<sup>o</sup> 1865.

TUCK, JOSEPH HENRY. — “Improvements in packing for pistons, piston rods, valves, and other uses.” This object is accomplished “by constructing the packing with a block or core of india rubber or other suitable elastic material, surrounded or covered by folds of flexible material or fabric, the india-rubber block or core being so placed or arranged and of such form and size as to be calculated by its elasticity to keep the fabric close against the rubbing or bearing surface during the wear of such fabric.” “In some cases it might be sufficient to place the india rubber in combination with the flexible material, without the former being covered by the latter.” It is preferred that “the flexible material should be that of canvas, coated or

502 INDIA RUBBER AND GUTTA PERCHA :

“ saturated with a solution of india rubber or other suitable composition ; but this material may be varied.” “ The block or core may be out of the centre.”

[Printed, 8d.]

A.D. 1854, August 26.—N° 1870.

WALL, GEORGE.—“ Improvements in machinery or apparatus for the manufacture of pottery.” These are, “ the use of a concentric mould made in separate parts, so constructed that the necessary force or pressure is applied to each part successively, beginning at the centre part, and ending at the last or external part, by which the pressure is so much reduced and gradually applied that the common absorbent moulds of plaster of Paris will bear it, with the assistance of an iron case or hoop round them ;” and “ to prevent the adhesion of the clay to the non-absorbent material of the concentric mould, using” a “ sheet of stretched caoutchouc between it and the clay, which has the double advantage of forcing the article out of the mould by its own contraction, and giving it a finished surface.”

[Printed, 10d.]

A.D. 1854, August 28.—N° 1884.

GRAY, JOHN.—“ Improvements in the mariners’ compass.” These are, “ so arranging and constructing ships’ compasses as to counteract the vibratory action to which they are subject in steam ships and other vessels.” “ The compass is suspended within a vessel or bowl which is held in a state of suspension within another vessel or bowl containing fluid,” preferring “ thick varnish, on account of its adhesive and sluggish action, which is beneficial in keeping the inner bowl steady ;” and “ connect the bottom of the inner vessel or bowl with the bottom of the outer vessel or bowl by springs ;” and also “ connect the upper and inner rim with the outer rim by vulcanized india-rubber or other springs, the inner vessel or bowl being kept in a central position by tangential screws, so as to counteract the lateral action, whilst the springs below will regulate the vertical position of the inner bowl in conjunction with the fluid contained in the outer bowl.”

[Printed, 9d.]

A.D. 1854, August 30.—N° 1895.

MATHIEU, JULES (*a communication*).—"Improvements in pumps."—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists as follows :—"A flexible tube of vulcanized caoutchouc or other suitable material is bent round into a circular form, and placed within a cylindrical box or hoop of metal or other rigid material. A roller is mounted upon an arm attached to a shaft placed concentric with the box, and this roller compresses or squeezes the flexible tube, so as to flatten it at the part in which it comes in contact with the roller. The shaft being caused to revolve, any liquid contained in the tube is driven before the roller, and expelled from one end of the tube, while fresh liquid may be allowed to enter at the other end of the tube." "The flexible tube may be strengthened by internal linings or external casings, or both, of leather, canvass, cloth, gutta percha, or other suitable substance, sewn, or screwed, or otherwise attached to the flexible tube."

Other modifications of the above are described.

[Printed, 3d.]

A.D. 1854, August 31.—N° 1902.

ILLAKOWICZ, MICHEL NAPOLEON.—"Improvements in picture frames."—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists in "rendering the same picture frame susceptible of being enlarged or diminished in any given proportion, and that without deranging the position of the ornaments." These "frames, and also the ornaments used with them, can be made of any suitable metal or other material, such as gutta percha, papier maché, wood, or of any combinations thereof." They are made "in 8 principal pieces, the usual frames being divided into 4 at the centres of the four pieces composing the frames; at the back four other pieces, on which, by means of mechanism, the four corner pieces are made to slide. Thus the proportion of the parallelogram, as well as the size, can be changed at pleasure."

[Printed, 3d.]

## 504 INDIA RUBBER AND GUTTA PERCHA

A.D. 1854, August 31.—N° 1905.

BERNARD, JULIAN.—“Improvements in the manufacture of “combs.”—*This invention is void by reason of the patentee having neglected to file a Specification in pursuance of the conditions of the Letters Patent.*—It relates to the manufacture of combs in vulcanized caoutchouc and gutta percha. The material is placed in a heated pressure chamber. The material softened by heat is forced into a mould of a comb, also heated. “The mould and the material are both held in vacuo.” “The moulding may be performed with or without the aid of exhaustion, but with the use of exhaustion a much sharper form and more perfect result is obtained.”

[Printed, 3d.]

A.D. 1854, August 31.—N° 1908.

DUNLOP, JOHN MACMILLAN (*partly a communication*).—“Improvements in machinery or apparatus for preparing, cleaning, and cutting india rubber and gutta percha.” The machine for preparing and cleaning consists of a vessel divided by a partition, in which is caused to revolve a cylinder, the periphery of which is covered with knives, and beneath which is fixed a series of knives keyed into a stationary framing. The vessel has a continuous supply of clean water, &c. In cutting cylindrical blocks of the above substances, “imparting rotary motion thereto while cutting, by means of a surface roller or rollers.” The cylindrical blocks are mounted upon a roller in preference “by pressure, and with or without heat or steam.” A roller, called “the surface roller,” is placed behind the cylinder covered with the material, which moves it forward to the cutting knife, upon which a stream of water is directed. The arrangements are such that, “should the surface roller” “fail in causing” the cylinder of material to rotate, “its advance towards the knife will also be arrested.” Below the knife is a wheel, “the periphery of which is in contact with the cylindrical block,” and “in such a position that the centres of the two continue on the same plane during the cutting of the material.”

[Printed, 11d.]

A.D. 1854, September 1.—N° 1914.

DANKS, JAMES.—“An improvement or improvements in ink-stands, which improvement or improvements may also be applied

“ to the stoppers of bottles, the packing of pistons, and other like purposes,” as follows :—“ The use of a ring or rings of vulcanized caoutchouc or other elastic substance fixed in a groove or grooves on the funnels of inkstands and label dampers, or on stoppers, pistons, or such-like bodies.” The reservoir containing the ink has a hole at the top, in which is placed a “ funnel or dipping cup;” in the pipe of the funnel is a groove, in which is a ring of vulcanized india rubber. By depressing the funnel or dipping cup the air in the reservoir is compressed, and the ink forced into the dipping cup. By raising the funnel or dipping cup the air in the reservoir will be rarified, and the ink will return from the said dipping cup into the reservoir.” “ The label damper exactly resembles the inkstands, excepting that it has a disc or layer of some porous fabric, stretched over and fixed to the top of the funnel,” &c.

[Printed, 5d.]

A.D. 1854, September 2.—N<sup>o</sup> 1922.

CRADDOCK, THOMAS.—“ Certain improvements in the steam engine.” These are, in arrangements whereby “ the expansive valve is made to alter the cut-off of the steam on its entering the cylinder, so as to apportion the quantity of steam admitted on to the piston in proportion to the resistance the engine has to encounter, by which means great economy in the use of steam and regularity in the motion of the engine is obtained.” This is accomplished “ by the application of a worm and worm-wheel acting in connection with the governor, the resistance of the expansive and steam valve being reduced to a minimum amount by causing the pressure of the steam to act on the back of the valve through the intervention of a vulcanized india-rubber tube, filled with cold water.” “ The fluid in contact with the india-rubber, which is cold water,” “ is in contact with the steam that enters the engine.” “ In this way the most complete equilibrium is established between the pressure of the steam on the face of the valve and the force on the back of it, so that the motion which alters the cut-off is imparted to the valve with ease; the wear is much less, and the object is attained efficiently.”

[Printed, 11d.]

506 INDIA RUBBER AND GUTTA PERCHA :

A.D. 1854, September 2.—N° 1923.

KAY, RICHARD DUGDALE.—“Improvements in machine printing.” This consists “in using a series of thin cotton fabrics, or fabrics of linen warp and cotton weft, coated on one side with india-rubber cement. These cemented fabrics are folded face to face, with the uncemented surface outside; one of such folded fabrics is then wound on to the cylinder to the thickness required. The pressure in the act of winding will cause the cement to permeate through every fold of the fabric, and the whole will become one solid mass.”

[Printed, 3d.]

A.D. 1854, September 4.—N° 1929.

WHITE, JOHN LOCKHART, HENDERSON, HENRY, and COUPER, JAMES, senior.—“Improvements in water-closets.” These are, constructing water-closets with the basin or pan, and the valve with its seat, all composed of glass. The glass preferred is opal, and the following may be the mode of construction:—The ordinary hole or opening in the upper part of the pan or basin, through which the water is admitted from the cistern, is intended to be cut by a small lathe with a hollow copper drill, oil and emery being also used.” “For the valve at the lower part of the pan or basin,” in preference making “it somewhat in the form of a convex glass lens, and fitting it to its position or seat by grinding, so as to make a water-tight joint; or a piece of vulcanized india rubber or gutta percha may be adapted and applied to such position or seat for the glass valve to fit against.”

[Printed, 6d.]

A.D. 1854, September 4.—N° 1934.

SKIDMORE, FRANCIS ALFRED, and BOLTON, JOSEPH.—“Improvements in the manufacture of cast-iron pipes.”—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists in “casting pipes with screws on their ends,” and by preference “with male and female screws, that they may screw one into the other; but other forms of screws may be used.” And “introducing a washer of gutta percha, or other suitable material, at the end of the screws, and when the pipes are screwed together the joints will be found very complete.”



A.D. 1854, September 5.—N° 1940.

STOCKER, SAMUEL.—“Certain coverings for various parts of the human body, with a view to the preservation of health.” First, coverings for the teeth; these may be “constructed of a flat metal tube, or two plates of ivory, horn, gutta percha, &c., so as to form a chamber, &c., the front plate perforated, and which may in part be faced with thin teeth.” “The apparatus is placed inside the lips. Another kind of these coverings consists of a moustache, completely covering the mouth, and set upon a plate or wire to be held within the lips.” Second, consists of coverings for the head, by which the head, face, and neck may be protected from the wind. One covering of this class is formed as a hat, with apertures in front, near the lower part, filled in with glass, wire work, or other suitable material, which may be drawn down by an elastic band over the eyes, so as to protect them, and at the same time to allow the wearer to see,” &c. &c. Another “is in the shape of an umbrella,” &c. &c. Another “consists of an elastic shoe or boot, formed of india rubber, which is sewn or embroidered with worsted thread, for the purpose of allowing the perspiration to pass off, thus getting rid of the damp complained of in boots or shoes formed of this material.” Also “forming clogs or goloshes of papier maché japanned, protected beneath by leather or gutta percha, nailed, or otherwise attached to the under side of the same, so as to form a light and warm covering for the feet.”

[Printed 7d.]

A.D. 1854, September 8.—N° 1957.

YOUIL, JOHN.—“Improvements in the mode or method of fermenting liquors, and in the machinery or apparatus employed therein.” These are, first, “excluding the atmospheric air during fermentation, and at the same time allowing the escape of carbonic acid gas,” in order to produce “malt liquors free from acidity.” Over the barrel or tunning cask is placed a vessel which is termed “a barm receiver,” on the top of which is a valve to let out the gas,” &c. A double tube is arranged “for filling up the tunning casks whilst the barm is allowed to escape through its outer part.” Air-tight covers or lids are fixed “by making a groove or kind of spout all round the inside of the

508 INDIA RUBBER AND GUTTA PERCHA :

"trough or stillion, near its upper edge, within which the under edge of the cover or lid will fall, being lowered for that purpose by means of ropes and pullies, or other suitable contrivances," and filling the "groove with water, or a composition of oatmeal, flour, and water, or other suitable cement, by which the atmospheric air will be effectually excluded." The "covers or lids may be fixed by placing on the top edge of the trough, stillion, or barm receiver, a strap of galvanized india rubber, and inserting in the top edge a series of screw bolts, to pass through the lid or cover when it is lowered to its place," and "make it air-tight by means of thumb-screws and cement."

[Printed 9d.]

A.D. 1854, September 11.—N<sup>o</sup> 1980.

**SZONTAGH, SAMUEL.**—"Improvements in sewing machines." These are, first, "in the construction of a needle for sewing leather," as follows :—"Making the front of the needle flat and broad," and placing it so that "the broad and flat part of the needle makes an angle of about 45 degrees with the line of the thread which passes through the eye of the needle, and is designed for the purpose of preventing the holes formed by the needle cutting the thread of the stitch last made." Second, "keeping the shuttle against the shuttle box," "by magnetizing the part against which the shuttle slides." The shuttle is formed of iron, or, what is preferred, "iron combined with a newly-invented preparation of india rubber, known as 'pro-tean,'" &c.

[Printed 6d.]

A.D. 1854, September 13.—N<sup>o</sup> 1993.

**BETTELEY, JOSEPH.**—"Improvements in giving elasticity to ships' standing rigging."—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists in giving elasticity "to wire ropes and other ships' standing rigging, in order to prevent the evil effects of sudden shocks," by "attaching an india-rubber or other spring on to the lower end of the rope, and fastening it to the ship's side, in place of the present rope lanyards."

[Printed, 3d.]

A.D. 1854, September 18.—N° 2013.

THOMPSON, NATHAN, junior.—“Improvements in life-preserving seats.” “The seat is similar to that of an ordinary stool, the sides at the upper part being boxed in as usual, and a bottom is fitted thereto in such a manner that the sides and bottom of the seat form a water-tight compartment. At the lower part of the sides of the seat other water-tight compartments are hinged, or otherwise attached, so that, when the seat is laid upon its side, the body of a person by being pressed against such water-tight compartments, may open them out to admit the body of the person to pass between them, and after such passage through the body the water-tight compartments are caused to assume their former positions by the action of india rubber or other suitable springs.”

[Printed, 6d.]

A.D. 1854, September 20.—N° 2024.

TYLOR, ALFRED, and FRASI, HENRY GEORGE.—“Improvements in waterclosets.” These consist “in the use of two valves, an inlet valve and an outlet valve, a few inches apart (instead of a single valve as now used), in connection with a closed vessel, which acts as an air vessel, of sufficient capacity to contain the water required to flush or cleanse the pan or basin of the closet,” &c. The seats of these valves in preference are made of vulcanized india rubber. These waterclosets may be supplied with water by the apparatus described in the specification of a former Patent, N° 299, 1853, namely, “the actuating the pan or valve lever of closet by the water supply valve.” One improvement is said to consist “in having the part known as the container made of earthenware, and the pan of gutta percha or of earthenware, instead of having the pan and container of metal, as heretofore.” “And the container and trap made of one piece of earthenware, having the pan or valve working in the said trap, thereby making them double sealed or trapped above the floor of the closet.”

[Printed, 7d.]

A.D. 1854, September 26.—N° 2066.

CORNIDES, LOUIS.—“A new mode of manufacturing a transparent medium, plain, printed, and colored, of gelatine in com-

" bination with other substances." In carrying out the above, glass is coated with gelatine, sugar, and water, to form a transparent substance capable of being colored with water colors after coating it with a waterproof medium. "The waterproof medium or covering may be composed of wax and drying oil, in the proportion of one part of wax to four parts of drying oil, which may be spread on or may be impressed by any of the transfer processes above mentioned; or the waterproof medium may be made of oiled paper, or the waterproof medium or paper coated or covered on one side with the before-mentioned wax composition or india rubber solutions cut out to the required form and applied to the gelatine, slightly wetted for that purpose."

(See "Abridgements of Specifications on Bleaching, Dyeing, and Printing.")

[Printed, 4*d.*]

A.D. 1854, September 26.—N° 2070.

SINCLAIR, the Honourable JAMES, commonly called Lord Berriedale.—"Improvements in treating, cleansing, and ornamenting paper and other surfaces." These are, first, "the application and use of rollers or rotating parts, carrying strips of caoutchouc or other soft and elastic substances for the purpose of treating, cleansing, ornamenting, finishing, and polishing paper, woven fabrics, leather, yarns, threads, and other surfaces by the frictional contact therewith of the caoutchouc composing such rollers."

Second, "the system or mode of cleansing or removing coloring matter from paper and other surfaces by the action of rotating caoutchouc or elastic edge or surface pieces."

[Printed, 1*s.* 4*d.*]

A.D. 1854, September 27.—N° 2079.

RENFREW, ROBERT.—"Improvements in bobbins." These are, making "the barrel or central spindle portion of the bobbin" of wood, metal, or other suitable material, and the end discs or flanges are made of gutta percha, or of a composition wherein gutta percha is an ingredient, or of other suitable material or composition possessing the like qualities." "Papier maché

AIR, FIRE, AND WATER PROOFING. 511

“ or pasteboard material may also be used for this purpose.”  
“ The end discs or flanges so made are shaped and attached to  
“ the spindle or barrel piece at one and the same operation; and  
“ in thus making the bobbins” it is preferred “to mould the  
“ disc pieces upon the barrel or spindle piece by means of suitable  
“ dies or moulds. The flange parts may, however, be made  
“ separately, and fixed upon the barrel or spindle by a subsequent  
“ operation.”

[Printed, 7d.]

A.D. 1854, September 29.—N° 2096.

JOHNSON, JOHN HENRY (*a communication from Paul Désiré Chaumont*).—“ Improvements in machinery for removing the points  
“ from the hairs of rabbit and other skins employed in the manu-  
“ facture of hats and similar articles.”—*This invention received  
provisional protection, but notice to proceed with the application for  
Letters Patent was not given within the time prescribed by the Act.*  
—It consists of “a series of nippers composed of bars or blades  
“ of metal, arranged to work in a frame by the action of a crank  
“ connecting rod.” The skins to be operated upon “are carried  
“ on a drum underneath the nippers, and as they pass along the  
“ nippers lay hold of the extremity of the hairs, and remove  
“ them.” “In order that the action shall be as nearly as pos-  
“ sible analogous with the action of the thumb and fore-finger,  
“ one of the nipping blades is grooved longitudinally at its  
“ nipping edge, and is covered with caoutchouc, whilst the other  
“ nipping blade is knife-edged or bevilled to fit into the grooves  
“ of the first one. By this means an elastic nipping action takes  
“ place as the caoutchouc gives way under the slight pressure of  
“ the opposite blade, and is pushed into the groove where the  
“ tips of the hair are held firmly, and ultimately plucked off by  
“ a backward movement of the two blades combined; this last  
“ movement is allowed for by springs of caoutchouc attached to  
“ each side of the nipping bars and to the fixed portion of the  
“ framing.”

[Printed, 3d.]

A.D. 1854, September 30.—N° 2103.

POOLE, MOSES (*a communication*). —“ Improvements in con-  
“ densers.” These are the “so arranging the tubes in such

512 INDIA RUBBER AND GUTTA PERCHA :

" condensers that each may expand independently of the others ;" this do by " causing them at one or both ends to pass through a " packing formed of a sheet of vulcanized india rubber, or other " suitable material, which is supported by collars formed on the " tubes, and is kept in place by plates of metal pressed thereon, " by screws, or other suitable apparatus."

[Printed, 6d.]

A.D. 1854, October 2.—N° 2107.

WALL, GEORGE.—"Improvements in the manufacture of rail-  
" way tickets and other similar articles from a substance or mate-  
" rial capable of being re-used."—*This invention received provi-  
sional protection, but notice to proceed with the application for  
Letters Patent was not given within the time prescribed by the  
Act.*—It consists of making the above articles of " gutta percha,  
" caoutchouc, or any compound thereof, of a suitable strength or  
" thickness, which may be printed or stamped with the date,  
" progressive number, &c., as is now adopted with the paper  
" tickets." "The advantages of this improved ticket are, its  
" durability, and its being capable of being used over and over  
" again, as it will only be necessary to immerse the old ticket, if  
" printed upon, in any suitable chemical ley, by which the ink  
" will be discharged ; or, if stamped, to apply a gentle heat and  
" pressure, and the ticket will be ready for re-use."

[Printed, 3d.]

A.D. 1854, October 4.—N° 2134.

CROSSLEY, THOMAS (*a communication*).—"An improved mode  
" of manufacturing printing blocks," as follows:—"Take a  
" block of maple or other suitable wood, and cover its surface  
" with fine saw kerfs running at right angles to each other," and  
about  $\frac{1}{4}$  inch deep. The prismatic pieces formed are then removed  
from those portions of the block not covered by the figure or  
design, "and are left remaining upon those portions which are  
" covered by the figure." "The gutta percha is then softened in  
" the customary way and laid upon a flat surface." "The block,  
" prepared as above, is then pressed upon the gutta percha, by  
" which means the latter is forced into the interstices between the  
" minute prisms which compose the figure."

[Printed, 6d.]

A.D. 1854, October 4.—N° 2138.

PEERY, JOHN.—“Improvements in preparing wool for comb-  
“ing.” These are in “wool preparing machines;” first, “coating  
“or covering the upper feed roller or holding roller with vulcan-  
“ized india rubber or other suitable elastic material.”

Second, “imparting to the porcupine feed roller, or to the  
“holding roller or both, a reciprocating or traversing motion too  
“and fro across the machine,” by means of “an excentric or any  
“other suitable mechanical arrangement.”

[Printed, *5d.*]

A.D. 1854, October 14.—N° 2203.

MONZANI, LOUISA (*a communication*).—“An improvement in  
“brushes and brooms.” It consists “in the application of vul-  
“canized india rubber as an elastic material on those parts of  
“brushes and brooms, which in use are liable to be moved or  
“struck against skirtings, and other parts of buildings and  
“places or things which are to be dusted or cleansed thereby,”  
“by which application of vulcanized india rubber noise will be  
“prevented in the use of such brushes and brooms, and the  
“skirtings and other parts of buildings, places, or things will no  
“be injured by the hard parts of brushes and brooms, as hereto-  
“fore.”

[Printed, *6d.*]

A.D. 1854, October 14.—N° 2205.

PAPE, JOHN HENRY.—“Improvements in the manufacture of  
“boots and shoes.” These are, first, “in the substitution of  
“metal for sole leather for the under part of any kind of shoes  
“and boots (*chaussures*). Second, “in a certain elasticity pro-  
“duced by means of india rubber introduced between the shoe  
“and the sole, as well as in the inside of the heel.” “This metal  
“sole can be adapted to any sort of shoes.” “As usually made  
“for thin shoes or boots, a piece of leather or india rubber is put  
“on the iron sole, to prevent noise; this piece of leather or  
“india rubber is sewed or nailed with the iron sole, and they are  
“both covered with the edge.” “Another sheet of india rubber  
“is also applied between the sole, the heel, and the shoe, and  
“serves not only to prevent dampness, but also forms a kind of

514 INDIA RUBBER AND GUTTA PERCHA :

" hinge between the sole and the heel." " When the sole is fixed to the shoe by seams, these seams are generally made with soft iron or copper wire, but for strong shoes, nails, rivetted inside by means of a form covered with iron or steel are employed."

[Printed, 6d.]

A.D. 1854, October 16.—N° 2208.

BONNALL, JOHN.—" Improvements in apparatus for holding oil for lubricating purposes." These are, " forming these vessels of a flexible substance," " vulcanized india rubber ;" " they may be spherical or otherwise," and have " a suitable spout or nipple ;" if spherical, a weight is attached in order that the spout or nipple may be kept upright, or in such position as may be desired." " Supply may be obtained through the spout or nipple by collapsing the vessel, thus forcing out the contained air, when, upon applying the aperture of the spout or nipple to oil, and allowing the vessel to expand, the oil will flow therein."

[Printed, 5d.]

A.D. 1854, October 18.—N° 2231.

COOKE, BENJAMIN FRANKLIN.—" An improved mode of caulking ships, applicable also to the rendering of roofs waterproof." — *This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time required by the Act.*—It consists in using " an elastic caulking material " " known as sponge gum," which " is usually made by introducing alum into the ingredients of vulcanized india rubber, whereby the compound is rendered cellular after it has been subjected to heat in the well-known manner." " To reduce the cost of the india rubber or other gum used in this elastic compound," it is advisable to mix therewith fibrous materials or cork cuttings, in quantity not sufficient seriously to impair its persistent and elastic qualities." In applying the compound, " form a longitudinal groove in the edges of the planks, and insert a strip, a quarter of an inch thick (more or less), between the planks when they are being laid ;" or " fold the strip, or groove it on its edge, to



“ permit of its opening laterally when the planks shrink, and yet  
“ presenting a water-tight joint.” “ This mode of caulking is  
“ also applicable to the roofs of buildings for preventing the  
“ passage of water through skylights, &c.”

[Printed, 3d.]

A.D. 1854, October 19.—N<sup>o</sup> 2236.

MASON, SAMUEL, and BEEBY, WILLIAM.—“ Certain improve-  
“ ments in the manufacture of coverings for the human leg and  
“ foot.” These are, first, in making a “ blocked upper leather ”  
“ by means of stretching an upper leather or part of an upper  
“ leather with tongues, lace pieces, or back pieces thrown up by  
“ the blocking.” “ To these tongues, lace pieces, and back pieces  
“ is attached cloth, elastic material, or leather of various kinds.”  
Second, “ in laping over the insole the upper leather, and attaching  
“ the upper leather a second time to the insole by means described.  
Third, “ in obtaining an elastic waist to the common outsole of  
“ boots and shoes without any joining, which has hitherto been  
“ the practice.” “ This is obtained after the outsole is cut out of  
the hide in the form; then shave down the waist, rough it,  
then wet it; after which, let it dry, then apply a solution of  
“ india rubber to the waist; when dry, attach a piece of sheet  
“ india rubber of the form of the waist.” Fourth, “ inserting  
“ an elastic gussett in the tongues of the shoes, called the  
“ ‘ Grecian’s ’ and ‘ Albert’s ’ cut, to give ease to the instep in  
“ going on and in the wear.” Fifth, “ in producing a trouser  
“ boot or shoe, attaching the trouser to a boot or shoe, so making  
“ one covering for the leg and foot, and, when necessary, the  
“ application of elastic in such a manner over the instep that it  
“ may hold securely the heel in its position in the shoe, while the  
“ cloth or other material in the front of the leg of trouser is not  
“ blocked tight to the instep.” Sixth, “ blocking out of one  
“ piece of leather or cloth a seamless leg and instep piece, which  
“ is made into gaiters or riding leggings.”

[Printed, 10d.]

A.D. 1854, October 21.—N<sup>o</sup> 2246.

SMITH, WILLIAM JOSEPH. — “ A certain improvement in  
“ buttons,” which consists in applying and using “ embossed

518 INDIA RUBBER AND GUTTA PERCHA:

or cones of sugar which are to be drained to the action of an air pump or exhauster. "According to one modification of the apparatus, an air-tight chamber or vessel is employed, this vessel being put in communication with the suction pipe of the air pump, and also with the bottom of the mould in which the sugar is put. The communication with the latter is preferred to be by a pipe, provided with a stop-cock, to regulate the sucking or exhausting action." "A mouthpiece may be fixed on the end of this pipe, such mouthpiece being composed of caoutchouc, gutta percha, or some other suitable flexible material, so that when the point of the mould is introduced, the atmospheric pressure will cause the mouthpiece to clasp it, and so form an air-tight or nearly air-tight joint," &c.

[Printed, 10d.]

A.D. 1854, October 25.—N° 2275.

MATHER, COLIN.—"Improvements in machinery for boring in the earth, and for actuating a hammer for driving tubes into the earth, and other uses." In these improvements "the cutters or boring tools," "in place of being worked in combination with a lever actuated by a cam put in motion by a steam engine," are worked by the piston of a steam cylinder." "The piston is formed with a cup of vulcanized india rubber. The valve of the bucket consists of a disc of vulcanized india rubber, with a central spindle, and its seat is arranged so as to be retained within the cylinder when in use, yet so as to be lowered with the clack or valve separated, to allow of the parts being cleaned by jets of water," &c.

[Printed, 1s. 5d.]

A.D. 1854, October 28.—N° 2300.

VAUTHIER, CLAUDE FRANÇOIS.—"Certain improvements in blowing machines." These are constructing blowing machines as follows:—"Take a cylindrical metallic vessel, having an aperture in the centre of both its top and bottom covers. Through the aperture in the top cover a solid piston rod passes, while a hollow piston rod works in the opening in the bottom cover, through which the air is ejected." "In both the top and bottom covers, and near the edge of the same, are annular

“ orifices, provided with valves of india rubber, gutta percha, or other like suitable material, which open inwards, and are intended for the admission of air or other fluid into the machine. In the cylindrical vessel is a piston, consisting of two plates, the upper part of which is fixed on to the before-mentioned solid piston rod, which passes through the upper cover, while the lower plate is in a single piece with the hollow piston rod, which works through the bottom cover, and through which the air or other fluid is ejected or expelled. Both plates have openings, through which the air or fluid passes into the piston from the cylinder. Inside the piston, and over these openings are caps or valves of vulcanized india rubber, gutta percha, or other suitable material, so placed and adjusted as to close the openings in the top and bottom plates. These valves open inwards, and at each stroke of the piston the air or other fluid is drawn into the cylinder, and forcibly expelled through the hollow piston rod.” “ The machine is worked by steam or any other suitable motive agent.”

[Printed, 6d.]

A.D. 1854, October 31.—N° 2311.

REID, WILLIAM.—“ Improvements in the manufacture of galvanic batteries.” These consist in forming troughs of batteries, and their “ several partitions of one piece of glass, by moulding the same by pressure in moulds; and in order to protect such troughs from injury, they are cased on the outside with gutta percha, wood, coir, matting, or other tough material.”

[Printed, 3d.]

A.D. 1854, November 6.—N° 2347.

FARJON, LOUIS ALEXANDRE.—“ An improved system of jointing pipes, tubes, and conduits in general.”—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists “ of a clip, which takes into a rim or collar on one pipe, and into an inclined ring on the end of the other pipe, which is to be joined to it, an india-rubber or other like suitably elastic washer being interposed between the two pipes. This elastic washer fits into a channel in the end

"of one pipe, while a projection from the end of the opposite pipe abuts against it. The tightening of the joint is effected by turning the clip towards the inclination in the inclined ring, while the pipes may be detached by turning the clip the reverse way."

[Printed, 3d.]

A.D. 1854, November 8.—N° 2370.

CHAMEROY, EDMÉ AUGUSTIN.—"Improvements in the junction of sheet metal pipes, and apparatus employed therewith." These are first, covering pipes "with paper soaked in bitumen or other similar material." Second, "the application and use of rings of cardboard, caoutchouc, gutta percha, or metal, soft, cast, or otherwise secured on the ends of metal pipes." "The pipes are made slightly conical for that purpose." "The parts to be joined may lock into each other. In making a junction the gutta percha or caoutchouc ring" is first "cast in an ordinary mould of the requisite form, and afterwards heated and applied to the end of the pipe," which fits again into another pipe, "such pipe being heated at that part if found desirable, for the better adhesion thereto of the ring of india rubber." Third, "the several forms of pipe junctions." Fourth, "the grooving tool," "in the formation of pipe junctions." Fifth, "the system or mode of closing up pipe junctions by means of a piercer or nipper containing one or more suitably shaped anti-friction nippers."

[Printed, 10d.]

A.D. 1854, November 9.—N° 2378.

SHAW, STEPHEN.—"An improved template for marking positions and sizes in plates of metal."—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists in making a template of a sheet of zinc, gutta percha, "or any suitable metal or material," perforated with small holes, fastening at each end a strip of hoop-iron or other material to strengthen and stiffen it.

[Printed, 3d.]

A.D. 1854, November 9.—N° 2384.

ROSS, GEORGE (*a communication*).—"Improvements applicable " to the manufacture of articles of caoutchouc, or of compositions " of which caoutchouc forms a component part." These are working up and moulding " into any desired shape scraps and " waste pieces of cured or vulcanized rubber," and also " in the " application of heat, either to india rubber in its native state, or " to rubber with the substances commonly used in vulcanizing " rubber, or to rubber which has once been vulcanized by means " of steam, the rubber or compound while thus heated being " pressed into moulds or dies, which come in contact with the " rubber or compound to be acted upon." "By this means the " process of curing rubber is greatly facilitated, and vulcanized " rubber, which has hitherto resisted all attempts to remould it " may be readily pressed into any desired shape." "By thus " treating rubber, also many foreign articles, such as scraps of " cloth, sulphur, white lead, coal or wood tar, or any adhesive " substance, may be so combined with it as to produce a substance " which has all the valuable properties of vulcanized india rubber, " although the greater bulk of it is composed of other and cheaper " materials." "The induration of the rubber or substance thus " formed is regulated at pleasure by admitting cold water around " the moulds and dies in place of the steam, and thereby checking " the curing of the rubber at any desired stage of the process." "The different substances of which the articles are to be composed, " such as old pieces of vulcanized rubber, scraps of cloth, sulphur, " white lead, coal tar, &c., are first ground or kneaded together, " by being passed through calender rolls, or by any of the " methods commonly practised, and then placed in the moulds."

[Printed, 1s.]

A.D. 1854, November 10.—N° 2394.

RIMMEL, EUGENE (*a communication from Hippolyte Magen*).—"Improvements in combining matters to be employed in coating " fabrics and leather, and for other uses, in substitution of india " rubber." These consist in combining the following matters, so " as to produce suitable compounds for coating fabrics and " leather, and for other uses, in substitution of india rubber;" " for which purposes there are to be melted in rain or in distilled

## 522 INDIA RUBBER AND GUTTA PERCHA:

“ water a quantity of alum and sulphate of iron, and then soap  
 “ (made of seal oil and potash by preference) is added. The mix-  
 “ ture is allowed to cool, and is then washed well with pure water.  
 “ The mixture is heated and evaporated briskly to a pasty state.  
 “ Linseed oil, which has been boiled or thickened separately,  
 “ whilst still hot, is mixed therewith, and then some raw or  
 “ unboiled oil is added.” “ This, when for coating fabrics or  
 “ leather, is to be first applied, and then a second coating is to  
 “ be used, of a compound of the above, thinned with linseed oil;  
 “ and when the colour of the compound is desired to be varied  
 “ from those natural to the compounds, whitening and coloring  
 “ matters, combined with turpentine or essential oil, are added.”  
 “ In making more solid compounds, more sulphate of iron is  
 “ used with sulphur, and heat is applied for a longer time.”

[Printed, 3*d*.]

A.D. 1854, November 15.—N<sup>o</sup> 2418.

BROOMAN, RICHARD ARCHIBALD (*a communication*).—“ Im-  
 “ provements in the manufacture of thread from gutta-percha  
 “ and similar gums; in gilding, silvering, and ornamenting the  
 “ same, before or after being manufactured into fabrics; and in  
 “ machinery and apparatus employed therein.” These are “ the  
 “ manufacture of thread from gutta percha, caoutchouc, and  
 “ other similar gums,” as follows:—“ Surround a thread of silk  
 “ with a strip of gutta percha,” “ place it on a hot plate,”  
 “ plunge it in cold water,” “ then, holding the end of the gutta  
 “ percha and of the silk,” “ draw them out through the fingers  
 “ or through a draw-plate.” “ The operation is repeated from the  
 “ point where the gutta percha ceased, until the whole of the silk  
 “ is covered, and the joints are made good, if necessary, by heat  
 “ applied by the hand, or by an iron.” To produce a thread of  
 “ gutta percha as above, take a strip or rod of gutta percha, and draw  
 “ it out in a similar manner to the above. To produce “ a gutta  
 “ percha thread round a textile thread,” the following apparatus  
 “ is employed:—“ Construct a box, which may be hermetically  
 “ closed, except at the bottom, which is pierced with a number of  
 “ holes, so as to form a draw-plate, with apertures of the number  
 “ and degree of fineness required. Having placed through the  
 “ apertures some threads, say silk threads, with the reels placed

“ in the upper part of the box, gutta percha, softened by heat, is  
 “ put in the box, which it is made to about half fill, and the box  
 “ is filled up with hot water. The cover of the box is hermetically  
 “ fixed at the edges, but contains through the centre a pipe,  
 “ which communicates with a hydraulic pump. When the  
 “ threads are drawn through the apertures in the bottom of the  
 “ box, pressure is applied by means of the hydraulic pump.”  
 “ To make drawn threads of gutta percha without core,” “ make  
 “ use of a metal box traversed by tubes, similar to a tubular  
 “ boiler, and this box is heated by water, air, or steam. Rods or  
 “ pieces of gutta percha are passed through the tubes in the box,  
 “ and are received upon a cylinder which is made to dip in cold  
 “ water, from which the threads are wound upon another cylinder,  
 “ which, being of larger diameter, or revolving at greater speed,  
 “ draws out the thread to the fineness required.” “ In order to  
 “ gild or silver the threads or fabrics of gutta percha, instead of  
 “ employing small sheets of gold or silver leaf, cause the gold or  
 “ silver leaf to be wound with sheets of paper, as usual between  
 “ each layer, into a roll of any desired length; and for the pur-  
 “ pose of gilding or silvering gutta percha after being softened by  
 “ heat, it is first formed into a roll, and both the gutta percha  
 “ roll and the gold or silver leaf roll are simultaneously unrolled  
 “ against each other.”

[Printed, 8d.]

A.D. 1854, November 17.—N° 2439.

KENNEDY, THOMAS. — “ Improvements in shot or projec-  
 tiles.”—*This invention received provisional protection, but notice  
 to proceed with the application for Letters Patent was not given  
 within the time prescribed by the Act.*— It relates principally  
 “ to the arrangement and construction of cylindro-conoidal  
 “ shot or projectiles, in such a manner that great accuracy  
 “ of flight and certainty of effect are secured.” In carry-  
 ing out this invention, “ the cylindrical portion, forming the  
 “ after part or base of the projectile, is made hollow, for the  
 “ purpose of receiving a series of moveable feather pieces, which  
 “ are arranged to be pressed through or into longitudinal slots in  
 “ the cylindrical portion of the projectile by a piece of caoutchouc  
 “ or other elastic material, also contained in the hollow of the  
 “ projectile.” The “ piece of caoutchouc is inserted into the

524 INDIA RUBBER AND GUTTA PERCHA:

"hollow of the shot, so as to press against all the four flanged sides, and thus tend to keep the feathers fully projected outwards," &c.

[Printed, 3d.]

A.D. 1854, November 20.—N° 2452.

KEEFE, RICHARD.—"Improvements in dressing flour."—These are "the general arrangement and construction of a silk machine or sieve, and the mechanism for working it." The machine consists "of a long wooden shaft, triangular in the cross section, and duly mounted in bearings at each end, from which is suspended a triangular open frame of wood, covered internally with calico at the sides, and with silk of the required fineness at the lower part, thereby forming a sieve open at each end." "To each end of the shaft is fixed an upright bar, to the upper end of which is connected a rod, which is again connected to a crank, and these two cranks are on the same shaft, which may be driven in any convenient manner from a first mover, so as to impart a vibrating movement to the sieve suspended from the long wooden shaft." "The silk employed to form the bottom of the sieve must be of the proper number or degree of fineness," and "its elastic strength should be increased by the insertion of a strip of india rubber about an inch wide, and of sufficient strength to keep the silk from bagging under the weight of the meal, and at the same time with a softness of elasticity that will prevent the silk from being snapped asunder by the vibrating motion of the machine."

[Printed, 10d.]

A.D. 1854, November 20, N° 2454.

ADAMS, WILLIAM BRIDGES.—"Improvements in projectiles, projectile weapons, and their appurtenances."—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time required by the Act.*—It consists in constructing projectiles in such a manner "that they may be propelled from a smooth barrel as accurately as ordinary projectiles from a rifled barrel." Projectiles are described of different shapes and with feathers. The improvements in artillery are several, and one is "springs of caoutchouc or steel for field artillery."

[Printed, 4d.]



A.D. 1854, November 21, N° 2462.

THOMAS, WILLIAM LYNALL.—“An improvement in projectiles “and gun wads.”—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists in affording a supply of air in safe and proper quantity between the projectile and the powder, or other explosive material employed to propel the projectile;” this is effected “either by the projectile “itself or by means of a wad;” when by means of the projectile itself, “form an air chamber in the back thereof, and cover over “the bottom, or that end which comes nearest the powder, with “paper or other suitable material;” and when by means of a wad, “construct it with a conical or wedge-shaped aperture “therein, the apex of the cone or top of the wedge being at that “part of the wad which is placed farthest from the powder, or “other substance used to propel the projectile. The base or “lower part of the wad is covered with paper, &c.” “The wad “may be composed of a compound of gutta percha and lead, of “papier maché, or of any other suitable material.”

[Printed, 3d.]

A.D. 1854, November 22, N 2464.

TERRETT, RICHARD.—“An improved machine or apparatus for “cleaning knives,” “which may be constructed either on the “reciprocating or rotatory principle,” consisting principally of “two parts, viz., an outer fixed case, and an inner sliding or “revolving frame.” “The inner frame is made in two parts, “formed of wood, and faced with buff or any other suitable kind “of leather, a suitable elastic bed being placed between the wood “and the leather surface, so as to impart great elasticity thereto.” “These elastic beds, which form one of the principal features of “this invention, may be composed of stout felt, hair, india rubber, “indian weed, wadding, flocks, cotton, wool, confined air, or any “other suitable elastic substance or medium.” “The two parts “of the sliding or revolving frame are placed face to face, and “pressed together by means of screws, furnished with india “rubber or other elastic washers, so as to regulate the pressure, “and allow them to give way when necessary. In the sides of “the outer or fixed cases holes are formed sufficiently large to

526 INDIA RUBBER AND GUTTA PERCHA :

“ admit the blade of the knife to be passed through, the said holes  
“ or openings being in such a position that the blade of the knife  
“ shall at the same time pass between the buff leather surfaces of  
“ the inner sliding or revolving frame.” “The upper part of the  
“ sliding or revolving frame is furnished with a box, to contain  
“ flour of emery or other suitable polishing material, the bottom  
“ of the said box being provided with a small opening extending  
“ through the upper buff, so as to supply the said emery or other  
“ material to the surfaces of the buffs.”

[Printed, 9d.]

A.D. 1854, November 23, N° 2476.

SHAW, STEPHEN.—“ An improved mode of marking metal  
“ plates for rivetting or bolting, and the application of a new  
“ material as a template for receiving such marks.” In marking  
metal plates, this is effected “by means of an improved ‘ reverser,’  
“ which instrument resembles in appearance a pair of tongs, or a  
“ clip, having between the upper and lower parts a flexible  
“ tongue or spring. The ends of the clip or reverser are per-  
“ forated. The hole in the upper jaw enables the workman to see  
“ when the ends are exactly over the spot where the hole is to  
“ be punched in the plate. In a hole made in the tongue or  
“ spring is placed a tin cup or vessel, containing a small quantity  
“ of the marking fluid. The lower part of the cup terminates in  
“ a cylinder, which projects through the hole in the lower jaw.  
“ When the jaws of the clip are brought together, the pressure of  
“ the upper jaw forces the cylinder down upon the plate below,  
“ and causes a portion of the marking fluid to flow down the  
“ inside of the cylinder (which is made double for the purpose),  
“ and leave a mark or ring of colour upon the surface below the  
“ clip.” “ A sheet of zinc, gutta percha, or other suitable material  
“ perforated is used for the template.”

[Printed, 10d.]

A.D. 1854, November 23, N° 2479.

DUVIVIER, HENRI JULES, and CHAUDET, HENRI.—“ Im-  
“ provements in treating gutta percha.” These are treating  
“ gutta percha with one or more of the following substances,  
“ namely chloride, bromide, iodide, and fluoride of sulphur, boron,

“ silica, arsenic, and phosphorous, or sulphide of phosphorous, preferring the chloride of sulphur. To a solution of gutta percha in bisulphide of carbon, from two to fifteen per cent. of chloride of sulphur diluted with bisulphide of carbon is added. If any of the other substances are substituted for the chloride of sulphur then fifteen to fifty per cent. are added. The compound of gutta percha differs in properties with the percentage of the admixture in being more or less elastic; and more or less acted on by heat or cold; articles steeped in these solutions and liable to be damaged by the acid vapours formed during the operation, then carbonate of soda should be mixed with the solution of gutta percha in quantity sufficient to neutralize the acid formed.”

[Printed, 4d.]

A.D. 1854, November 27, N° 2497.

FONTAINEMOREAU, PETER ARMAND LE COMPTE DE (*a communication*).—“Improvements in the construction of inkstands.” These are, first, “in establishing, by means of a cock, a communication between the interior of the inkstand and the atmosphere, through a small channel, which crosses the tube, to which is adapted the key of the cock.” Second, “in adapting to the cock a fixed or moveable sucking or forcing pump, consisting of a small hollow ball of vulcanized india rubber perforated with holes.”

[Printed, 8d.]

A.D. 1854, November 29, N° 2512.

SMITH, SYDNEY.—“An improvement in guages for ascertaining the pressure of steam and other fluids.” This consists in applying a flat coiled spring above the vulcanized india rubber or flexible diaphragm, or partition of guages, for ascertaining the pressure of steam and other fluids; by which combination, when the flexible diaphragm or partition is pressed on and rendered convex outwards, it will press the flat spring also into a convex form outwards, and thus by the ordinary rack bar, give motion to the index hand.”

[Printed, 5d.]

528 INDIA RUBBER AND GUTTA PERCHA:

A.D. 1854, December 1.—N° 2529.

WILSON, THOMAS.—“Preventing the noise in omnibuses and “ other carriages travelling on common roads, streets, and rail-  
“ ways.”—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists “of  
“ the introduction of india-rubber blocks between the axletree  
“ and springs, in place of the wooden blocks now in use.” Also  
“ to prevent the noise arising from the windows, by lining the  
“ said windows and frames with india rubber.”

[Printed, 3*d*.]

A.D. 1854, December 2.—N° 2535.

HESS, RICHARD.—“An improved voltaic battery for medical  
“ and philosophical purposes.”—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists of a number of compound plates “of two different  
“ metals,” “one metal being negative, and the other posi-  
“ tive, as copper and zinc or silver and zinc.” Between each  
pair of compound plates is a plate of fibrous material (paper, felt, &c.) The whole is kept together by “drawing a tube of  
“ india rubber through a hole in each metallic and absorbent  
“ plate, and forcing a metallic wire through the tube, in order to  
“ effect a complete isolation between each pair of compound  
“ plates.”

[Printed, 3*d*.]

A.D. 1854, December 2.—N° 2541.

FONTAINEMOREAU, PETER ARMAND LE COMPTE DE  
(*a communication from Messrs. Langenhagen*).—“Improvements  
“ in the manufacture of palm-leaf hats, and carcasses for hats.”  
“ The leaf is split in its thickness either upon the whole width.  
“ or after it has been cut up into smaller breadths, either in the  
“ moist or dry state, by means of an ordinary knife, by a knife  
“ similar to that employed by basket makers, or by a suitable  
“ machine, after which the pith or marrow is removed from the  
“ inner surface of the split leaves by scraping or by any convenient  
“ means.” “The whole of the carcass of the hat, that is to say,

" the brim, the body, and the crown, may be formed of palm leaf  
 " split in its thickness, or one part only may be made of palm  
 " leaf split in its thickness, and the other part of palm leaf of  
 " its natural thickness. The palm leaf split in its thickness may  
 " be mixed with palm leaf of its natural thickness, or with  
 " cotton, hemp, flax, thread, silk, horse-hair, aloes, or vegetable  
 " silk, cane, whalebone, bamboo, straw, panama, manilla, osier,  
 " india rubber, gutta percha, or other similar substances."

[Printed, 3d.]

A.D. 1854, December 4.—N° 2547.

THOMSON, WILLIAM, RANKINE, WILLIAM JOHN MAC-  
 QUORN, and THOMSON, JOHN.—"Improvements in electrical  
 " conductors for telegraphic communication."—*This invention did*  
*not proceed to the Great Seal.*—It consists "in providing for each  
 " independent electric current in electrical conductors for tele-  
 " graphic communication a strand, cord, or rope, consisting of  
 " several conducting wires in contact with each other, with or  
 " without hempen or other cores, instead of a single conducting  
 " wire for each independent electric current, as formerly practised;  
 " such strands, cords, or ropes being coated with gutta percha  
 " or other insulating material, and protected either singly or in  
 " compound cords by iron cables or otherwise, in a manner  
 " similar to that now known and practised with respect to single  
 " conducting wires for each independent current;" the object  
 being "to obtain increased sectional area of conducting wires, and  
 " increased security against interruption of the communication,  
 " combined with increased flexibility, or any one or more of these  
 " advantages separately or combined."

[Printed, 3d.]

A.D. 1854, December 9.—N° 2587.

CORTLAND, JOHN.—"The safety of life at sea or in rivers."—  
*This invention did not proceed to the Great Seal.*—It consists  
 of "a self-disconnecting raft or bridge," which is composed of a  
 wooden frame, to the sides, ends, and bottom of which "are  
 " fastened air-tight tanks, tubes, or cassoons." The "air-tight  
 " tanks, tubes, or cassoons can be formed or made of various  
 " materials, such as iron, zinc, tin, copper, yellow metal, lead,

530 INDIA RUBBER AND GUTTA PERCHA :

“ india-rubber, gutta percha, wood, leather, canvass.” The sides, ends, and bottom of the “self-disconnecting raft or bridge can also be formed or made of cork, or any other buoyant and light material.”

[Printed, 3*d.*]

A.D. 1854, December 11.—N° 2599.

JACQUOT, FRANÇOIS.—“Improvements in the lining of hats, helmets, shakos, caps, and similar articles.” These are, constructing the linings of hats, &c. “of a tissue or looped fabric of silk or other fibrous substance, or of a perforated sheet of caoutchouc, gutta percha, leather, or other suitable material, so as to allow of the passage of air, and at the same time to present a light, soft, and elastic part to come in contact with and to embrace the circumference of the head of the wearer.” This may be effected by stretching the lining upon a light frame of metal, whalebone, or other suitable material, consisting of two rings united by light rods.”

[Printed, 6*d.*]

A.D. 1854, December 11.—N° 2610.

EBERT, CHRISTIAN HENRY RICHARD, and LEVISOHN, LIPPMANN JACOB.—“Improvements in the mode of rendering certain cases or receptacles extensible.” These are causing the back ends of “pocket books, pocket cases, blotting books, portfolios, and the like, and the top and bottom of portemonnaies and lady’s companions,” and the backs of “desks, and of any compartments therein, to be formed by an extensible band or connecting piece, composed wholly or partly of india rubber, gutta percha, or other suitable elastic material.”

[Printed, 10*d.*]

A.D. 1854, December 12.—N° 2613.

WHITE, TIMOTHY.—“Improvements in constructing portable houses and other buildings and structures.” These consist of peculiar means of combining sheet iron with bars of iron or frames of bar iron, by which great facilities will be offered in putting up, taking down, and packing in comparatively small

"compass." For this purpose "by preference, open frames of bar iron are made, which are connected together by screw bolts and nuts." "The sheets of iron of the sizes of the frames have their edges turned up, so as to pass between the two outer bars of two neighbouring frames, and they are nipped and held between them, there being a strip of vulcanized india rubber, felt, or other packing introduced to make the joint air and water tight; or, in place of the sheets of iron being bent at the edges, they may be made to overlap one another, and be held in each case between the bars of iron, fastened together by screw bolts and nuts, the joints, as in the former case, being made water-tight by introducing packing, as above stated."

[Printed, 6d.]

A.D. 1854, December 13.—N° 2615.

MAYER, Jos., and KIND, JOHN DAVID.—"An improvement or improvements in door knobs or handles made of china, earthenware, glass, or other vitreous or semivitreous substance, and in attaching the said knobs or handles to their spindles." Constructing the metal mounts used in attaching "door knobs or handles to their spindles of the kind of iron called malleable iron, that is to say, a kind of cast iron which is capable of being annealed," and attaching metal mounts to the "knobs or handles by means of gutta percha or compounds consisting principally of gutta percha." The mount "for the said knobs or handles consists of a square tube, having a flange at one end, and at the other two or more tongues in a line with the sides of the tube. When the tube is inserted in the knob the said tongues are opened out, so that it is no longer possible to withdraw the tube from the knob." "The opening of the tongues may be effected by a tool introduced down the tube, or by the knob having holes, into which the ends of the tongues enter, and which said holes deflect the said tongues."

[Printed, 6d.]

A.D. 1854, December 13.—N° 2623.

BERDAN, HIRAM.—"A compressible life-boat."—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time pre-*

*scribed by the Act.*—It consists in the construction “of a frame to support and sustain in shape a covering of india rubber, india-rubber cloth, or any flexible waterproof material to form a light portable boat, which when not required for service may be folded so as to occupy comparatively little room, but may be expeditiously extended and brought into proper condition to be launched for service.” The keel, the stem, and stern post are of one or more pieces of wood rigidly united. The ribs in preference jointed in the middle are hinged or pivoted to the upper part of the keel. The gunwales “are two light metal bars of proper curvature” attached to upper parts of the stem and stern post by a hinge or link; “and when the boat is not in use they fall down and lie parallel with the keel, stem, and stern post. When the boat is ready for use, the gunwale bars are kept in place by resting on the tops of the ribs, and between them will be placed cross stays to give stiffness to the framing.” “Applied to the frame is a waterproof covering made of one or more pieces, and attached in any desirable way to the gunwale bars, the keel, stem, and stern post, but not the ribs.” “When for a life boat, the covering should be provided with proper air chambers at stem, stern, and sides, to be inflated when required.”

[Printed, 3d.]

A.D. 1854, December 14.—N° 2637.

CORNIDES, LOUIS.—“Certain improved apparatus for coating or covering surfaces of glass or other material with collodion.” This consists “of an apparatus intended to facilitate and insure the coating or covering with collodion plates of glass or other surfaces requiring to be coated with such said material to be afterwards employed for various purposes, both useful and ornamental, by which means the great loss and inconvenience from the evaporation of æther, hitherto inevitable in such operations, is entirely obviated.” The apparatus employed for this purpose consists of four principal parts, namely, a vessel or receptacle capable of being made air-tight, and intended to receive the objects to be coated; an air-tight vessel or reservoir to contain the collodion; an air pump in connexion with the above-named vessels, and a worm for condensing the æther.” And in carrying out these arrangements, elastic rings or washers of



india rubber or other suitable material are employed to keep the receptacle air-tight.

[Printed, 7d.]

A.D. 1854, December 16.—N° 2648.

LIVSEY, PETER JOEL, and WEILD, WILLIAM.—“Improve-  
ments in cartridges and projectiles, and in the construction,  
mounting, and working of ordnance.” These are as follows:—  
In cartridges, forming them with a projecting tube containing  
powder; when placed in the gun they have a percussion cap; by  
striking a spindle in the breech outside they are ignited. In  
projectiles, making them “so as to expand and fill the bore of the  
gun, to destroy windage on the Minie principle,” with a leaden  
ring or disc grooved,” &c. In ordnance, constructing them in  
sections or rings which are to be jointed together; in this way  
large guns may be formed. Also grooving or rifling cannon by  
fixing ribs by screws, &c., and “employing a buffer or apparatus  
to give way to and destroy the shock” of the recoil. “The  
buffer or spring arrangement is placed” at the back of the  
breech, &c. In preference the springs, &c. are formed by vul-  
canized india-rubber rings, &c.; also in mounting heavy ordnance  
placing them “on an arrangement of mechanism similar to that  
used as turntables for railway purposes,” &c.

[Printed 1s. 5d.]

A.D. 1854, December 26.—N° 2723.

BLYTH, PHILIP PATTON.—“An improved application of mate-  
rials to the construction of screw propellers.”—*This invention  
received provisional protection, but notice to proceed with the  
application for Letters Patent was not given within the time  
prescribed within the Act.*—It consists “of the application of india  
rubber and gutta percha in a rigid state, either separately or  
combined, or in conjunction with metal or other suitable mate-  
rial, to the construction of screw propellers of all kinds, whether  
of the ordinary form or that known as the boomerang.”

[Printed, 3d.]

A.D. 1854, December 27.—N° 2732.

SINCLAIR, JAMES, the Honourable, commonly called Lord Ber-  
riedale.—“Improvements in machinery or apparatus for washing,

534 INDIA RUBBER AND GUTTA PERCHA:

"cloth or yarns."—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists "in the employment of revolving arms or blades, which are made to rotate rapidly in a cistern or suitable vessel of water or other cleansing liquid. At the extremity of each of the arms or blades is fitted a strip of vulcanized caoutchouc, which rubs against the fabric to be washed, and effectually cleanses the same without injury thereto, by reason of the elastic and yielding nature of the material employed." "The cloth may be entered into the top of the cistern by passing over a suitable guide roller, and thence proceeds downwards to and beneath a second guide roller, situated near the bottom of the vessel; from this roller the web passes round a third roller, situated on the opposite side of the vessel, and thence to another, thus running in a zig-zag direction up to the top of the cistern, whence it slowly emerges, after being subjected to the action of the revolving arms, the caoutchouc strips of which rub against both sides of the fabric as it traverses along over its guide pulleys." "As a set of these arms is situated between each space of the zig-zag formed by the cloth, it follows that the same will be washed on both sides simultaneously." Or, "in place of passing the fabric in a zig-zag direction from the bottom to the top of the cistern, it may enter at one end of a long trough or shallow cistern, placed in an inclined position to allow the dirty water to flow off freely, and is therein subjected to the action of a series of washing blades or arms, formed as herein-before described."

[Printed, 3d.]

A.D. 1854, December 28.—N<sub>o</sub> 2735.

WILLIAMS, MARGARET.—"Improvements in suspending swing looking or dressing glasses." These are, adapting springs, which may be spiral steel springs, or "vulcanized india rubber" "to the pillars, knobs, and axes or pivots of swing looking glasses," so as to render them "more steady in use, easier to adjust and keep in any desired position than by the methods of swinging glasses usually employed."

[Printed, 3d.]

A.D. 1854, December 29.—N° 2752.

PILLANS, JAMES.—“Improvements in the preparation of hema-  
“tosin and fibrinous and serous matter.” In these improve-  
“ments relating to the above subject a number of vessels are  
employed in separating the serum from the clot or other portions  
of blood. One vessel is named “the depositing vessel,” which it  
is stated “must have a hole pierced in its bottom, of about an  
“inch in diameter, or other convenient size, which is to be  
“stopped by a cork, a piece of vulcanized india rubber, or other  
“suitable substance.”

[Printed, 4d.]

A.D. 1854, December 29.—N° 2753.

FANSHAWE, HENRY RICHARDSON, and FANSHAWE, JOHN  
AMERICUS.—“Certain improvements in the manufacture of  
“various kinds of waterproof garments.” These are first “ren-  
“dering the entire texture of garments non-absorbent or wet-  
“repellent, by saturating, impregnating, or closing the pores  
“thereof with caoutchouc or other elastic insoluble gums or com-  
“pounds, and which may likewise be coated on one or both sides  
“with caoutchouc or elastic insoluble gums or compounds.”  
Second, “rendering the entire texture of garments non-absorbent  
“or wet repellent by using oil compounds in combination with  
“the coating of the same texture or fabric on one or both sides  
“with india-rubber or other elastic and insoluble gums or com-  
“pounds.”

[Printed, 4d.]

A.D. 1854, December 30.—N° 2764.

SHIPLEY, SAMUEL SMITH.—“Improvements in fittings suit-  
“able for dressing cases, and for other purposes of elegance and  
“utility.” These are the application “of glass, porcelain, or  
“other tubes or cases, in conjunction with novel and peculiar  
“caps or covers of metal, glass, or other material and fittings,”  
“for containing a shaving brush, tooth, or nail brush,” &c.,  
“(together or separately), shaving soap, tooth paste, pomade,  
“bandoline, cosmetique, or any other article for the toilet, or for  
“other purposes.” In preference, these caps are “lined in-

536 INDIA RUBBER AND GUTTA PERCHA:

“ternally with cork, india-rubber, or some such material, to surround the end of the glass tube or case, and fit tight thereupon.”

[Printed, 8d.]

---

1855.

---

A.D. 1855, January 5.—N° 31.

ASHWORTH, ROBERT, and STOTT, SAMUEL.—“Improvements in machinery for preparing, spinning, and doubling fibrous substances.” These are, first, “the adaptation to and employment” “of a compound spindle and tube or collar, in combination with the improved flyer,” &c. Second, “the pressing together of the rollers used for drawing or pressing fibrous substances by means of an elastic material or spring in such manner as not to exert any force or weight upon the bearings of the bottom or under rollers.” A hook or saddle is made to press upon the bosses of the upper roller by means of an india-rubber band attached to the lower end of this hook or saddle, &c.

[Printed, 1s. 4d.]

A.D. 1855, January 6.—N° 35.

JOHNSON, JOHN HENRY (*a communication*).—“Improvements in machinery or apparatus for effecting agricultural operations, parts of the said improvements being applicable for the obtaining of motive power for general purposes.” In these improvements one is said to be the “mode of driving and keeping up the digging bars to the area of earth to be operated upon by the agency of elastic frictional surface wheels or pulleys,” and these are of metal “with india rubber or other elastic surfaces.”

[Printed, 1s. 1d.]

A.D. 1855, January 10.—N° 65.

FULLER, WILLIAM COLES.—“Improvements in the construction and adaptation of india-rubber springs.” “Making suspension springs of india rubber for carriages, and covering and protecting the same, so as to ensure greater usefulness and durability.” “These springs may consist either of a ring or series of rings of india rubber, stretched over two reels or sockets of brass or other metal, or of one continuous cord (each end of such cord being securely fastened). The rings or cords may be either of round or square section, &c.”

[Printed, 11d.]

A.D. 1855, January 10.—N° 68.

LEHUGEUR, LOUIS PIERRE, and UTTINGER, MICHEL.—“Improvements applicable to machinery for printing fabrics.” These relate particularly to the construction “of the color table,” the use of which is claimed. “The color block or table is covered with a cloth of some air-tight and water-proof material, and the required elasticity is imparted to it by means of a collapsible vessel, made of india rubber or other suitable material provided with a counterbalance weight, which collapsible vessel is filled with water or other liquid, and will therefore, by means of its counterbalance weight, keep the printing cloth at the required tension,” &c.

See “Abridgments of Specifications upon Bleaching, Dyeing, and Printing.”

[Printed, 7d.]

A.D. 1855, January 12.—N° 84.

MILES, EZRA.—“An improved coupling joint or connexion for tubing or other purposes.” This consists, first, of, “the male portion.” Second, “the matrix, receptacle, or female portion.” Third, “the moveable or rolling packing.” Fourth, “the apparatus for keeping the portions together, and in their proper places.” Fifth, “a mode of plugging the female part of the joint.” The “moveable or rolling packing” is “a ring of india rubber or vulcanized india rubber;” and in some cases

538 INDIA RUBBER AND GUTTA PERCHA:

the rings may be formed of "flax, hemp, or of some similar fibre, woven, twisted, or spun, either alone or impregnated with chemical materials, for giving them a degree of mobility or elasticity." "After fitting on the fibrous ring, dip it into a cold concentrated solution of caustic soda or potash, by which means contraction takes place."

[Printed, 9d.]

A.D. 1855, January 12.—N° 90.

BROOMAN, RICHARD ARCHIBALD (*a communication*).—"Certain means of devulcanizing india rubber and other similar gums, or of treating such gums after having been vulcanized." The vulcanized rubber is ground, and the sulphur "extracted by boiling it with alkaline leys, soaps, and mixtures of alkalies with essential or fixed oils, grease, rosin, naptha, bisulphuret of carbon, ether, &c." After applying these, "the rubber is the washed and dried." If the vulcanized rubber contain "chalk, white lead, metals, oxides," &c., these may be separated by "acetic or pyroligneous acid," &c.; and "to give clearness to the gum it may be further treated with a solution of cyanide of potassium, hypochloride of lime or other like deoxidizing substance." The "devulcanization or change" is effected by substances which are "solvents of the native gums in connection with the employment of heat." The substances may be "naptha, bicarburet of sulphur," &c., but "spirits of turpentine" are preferred. If the product is required to be solid, the vapour of the turpentine is applied. If a soft or liquid product is required, the rubber is subjected to heated turpentine. When this latter is employed, "in order to prevent the mass from being tacky," "introduce alcohol or a small quantity of sulphur into the solution."

[Printed, 4d.]

A.D. 1855, January 16.—N° 112.

JACKSON, GEORGE.—"Certain improvements in the construction of tents." This is effected "by placing at the apex of the roof a key block, of circular, square, or polygonal form,

“ with mortices or openings to receive the number of rafters or ribs required by the intended form of the tent; these mortices or openings to be shaped or formed to receive the rafter or rib, also shaped at such angles as are required to ensure the desired pitch or inclination of the roof, and to receive the pressure of the outward band or ring to retain them in their places;” and to attach the rafter or ribs to the central key block, a binder or ring is employed, “ which may be of vulcanized india rubber,” &c.

[Printed, 1s.]

A.D. 1855, January 18.—N° 138.

PIDDING, WILLIAM.—“ Improvements in coverings for the feet of bipeds and quadrupeds.”—*This invention did not proceed to the Great Seal.*—It consists in manufacturing “ the soles and heels of boots, shoes, galoshes, and slippers, and also horse-shoes of caoutchouc, or compound thereof, having cells in it of various sizes connected together; the cells are each to have enclosed in them air, gas, or liquids.” “ It may be desirable sometimes to have the external surfaces of the soles and horse-shoes corrugated, and thus rendered greater than if they were perfectly flat,” &c.

[Printed, 3d.]

A.D. 1855, January 19.—N° 144.

MARTIN, ROBERT, and HYAMS, JACOB.—“ Improvements in goloshes or over shoes.” These relate “ to goloshes or over shoes when manufactured of gutta percha,” and consist “ in so forming those parts of the golosh or overshoe, which are intended to embrace the toe, the heel, and the sides of boots or shoes, as that when such said golosh or overshoe is applied thereto it only extends sufficiently far over the boot or shoe as to connect it securely thereto, and to cover those parts thereof where the junction of the sole and heel with the upper leather occurs, so as to render such parts impervious to wet or moisture,” Blocks or lasts of the forms required are employed, and the sheets of gutta percha softened by hot water are moulded to them by rubbing with the hand, &c.

[Printed, 10d.]

540 INDIA RUBBER AND GUTTA PERCHA :

A.D. 1855, January 19.—N° 151.

SMITH, WILLIAM, and PHILLIPS, THOMAS.—“Improvements  
“ in cocks or taps, and in balls or floats to be used therewith.”  
These are, first, “a mode of arranging cocks or taps with a surface  
“ of vulcanized india rubber between the plug and the barrel, for  
“ the purpose of forming a close though yielding connexion  
“ between the parts, and thereby preventing leakage.” Second,  
“ a mode of forming balls or floats to be used with cocks or taps  
“ for the purpose of opening and closing them.” These are  
formed as follows :—Two cones are united at their bases by what  
is “called seaming,” and having “pickled” them, “immerse them  
“ in a vessel of molten tin or zinc,” &c.

[Printed, 9d.]

A.D. 1855, January 25.—N° 185.

GREGORY, JOHN, and HOW, ANDREW PEDDIE.—“Certain  
“ improvements in steam engines, and in packing for pumps, and  
“ other machinery in which packing is required.”—*This invention  
received provisional protection, but notice to proceed with the appli-  
cation for Letters Patent was not given within the time prescribed  
by the Act.*—It consists in constructing packing “of tubes or  
“ hollow vessels of vulcanized india rubber, filled with air, or  
“ with gas, or water, or other fluid, and having their rubbing  
“ surfaces faced or not with metal;” also placing “in the upper  
“ part of the hot well of a steam engine a hollow vessel or bag of  
“ vulcanized india rubber, filled with air or other elastic fluid,  
“ which serves as a spring or cushion to equalize the flow of the  
“ water and prevent concussions;” also attaching “to the top  
“ and bottom of air-pump pistons discs of vulcanized india rubber  
“ inflated, so as to act on the water as a buffing apparatus.”

[Printed, 3d.]

A.D. 1855, January 25.—N° 193.

BURSILL, GEORGE HENRY.—“Improvements in cases or cover-  
“ ings for explosive substances or compounds.”—*This invention  
did not proceed to the Great Seal.*—It consists “in preparing or  
“ constructing cases, &c. of paper combined with material to



“ protect their contents from damp or wet.” For this purpose, using “ paper in combination with gutta percha or caoutchouc, or “ with asphaltum, or other waterproof varnish or material, which “ will render the cases or coverings impervious to wet or moisture.” “ The waterproof material may be applied to the case or “ covering, externally or internally, with similar effect.”

[Printed, 3*l.*]

A.D. 1855, January 29.—N<sup>o</sup> 221.

BINKS, THOMAS.—“ Improvements in raising and regulating “ the supply of water and other fluids.” These consist “ in the “ application of a closed top to the pump with sunk parallel “ guide bracket.” “ The interior of the working part of the “ pump is constructed of or coated with earthenware, glass, “ enamel, gutta percha, or other suitable non-corrosive material.” “ An air vessel composed of earthenware or other suitable mate- “ rial is attached to the tail pipe in lift pumps, and a similar air “ vessel is also attached to the forcing or raising pipe in force “ pumps, by which means the size of the pipes is greatly reduced.” “ The valves are composed of metal faced with leather, gutta “ percha, or other suitable material.” “ The tail and raising pipes “ in lift or force pumps are composed of iron or other suitable “ material, and may be coated internally and externally with “ earthenware or glass, enamel, gutta percha, or lead piping,” &c.

[Printed, 1*s.* 2*d.*]

A.D. 1855, January 29.—N<sup>o</sup> 225.

DEATH, EPHRAIM, and POPPLEWELL, JOHN.—“ An im- “ proved stop valve or cock for water, gas, and other liquids and “ fluids.”—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists of a stop valve or cock, in which there is a spindle, one end of which carries a disc faced with vulcanized india rubber or other suitable packing where necessary, the other end of the spindle is screw threaded for from a quarter of an inch and upwards, according to circum-

542 INDIA RUBBER AND GUTTA PERCHA :

stances ; it has affixed to it at top a suitable handle ; in the case of ballcocks the ball lever is fitted thereto. This screw works in a corresponding female screw cut in the head of the valve. A seat is provided for the inner side of the disc, and a passage for liquids or fluids is opened or closed by moving the disc one way or other.

[Printed, 3*l*.]

A.D. 1855, February 5.—N<sup>o</sup> 264.

BELLFORD, AUGUSTE EDOUARD LORADOUX (*a communication from Virgil Putman Corbett*).—"An improved invention for constructing hulls of vessels." First, "the employment of a layer of india rubber or other elastic waterproof material composed in part of india rubber, between the timbers and planking of the vessel." Second, "protecting the inner and outer sides of the india-rubber lining with canvass or other fabric of similar character," as follows:—An "outer layer of canvass should first be nailed or otherwise secured to the timbers," "then the india rubber applied and secured next the inner layer of canvas," "and finally the planking is to be applied."

[Printed, 6*l*.]

A.D. 1855, February 5.—N<sup>o</sup> 273.

DAFT, THOMAS BARNABAS.—"Improvements in the manufacture of beds or surfaces to recline or lie on." This consists in combining a series of tubes or hollow cells of india rubber or gutta percha, or compounds of these substances, so as to produce the extent of surface required." "It is preferred to employ those descriptions of india rubber which are rendered permanently elastic." "The tubular arrangement is in some cases vertical and in others horizontal."

[Printed, 4*l*.]

A.D. 1855, February 6.—N<sup>o</sup> 283.

AUDEMARS, GEORGE.—"Improvements in obtaining and treating vegetable fibres." The fibre particularly mentioned is

AIR, FIRE, AND WATER PROOFING. 543

from "the mulberry tree," and, after this is obtained by boiling with carbonate of soda and soap, washing with hot water acidulated with nitric acid, drying by pressure, afterwards soaking in a mixture of ammonia and alcohol, and bleaching "by chloride of lime or otherwise," hackling, &c.; it is "spun like cotton;" or "it may be converted into an explosive compound by the action of nitric acid, and then dissolved in a mixture of alcohol and ether, then mixed with a solution of caoutchouc, and drawn out into fine threads or filaments."

[Printed, 3d.]

A.D. 1855, February 7.—N<sup>o</sup> 292.

HOFFSTAEDT, AUGUSTUS JOHANN, and BLACKWELL, SAMUEL.—"An improvement in powder flasks and shot belts or pouches."—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists in "employing springs of vulcanized or permanently elastic india rubber as springs to act on the slides or valves of powder flasks and shot belts or pouches."

[Printed, 3d.]

A.D. 1855, February 12.—N<sup>o</sup> 324.

LUCAS, GEORGE.—"Certain improvements in machinery for preparing, spinning, doubling, and twisting cotton, wool, silk, and other fibrous materials."—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—Of these improvements, of which there are said to be several, one consists in the application or in a new or peculiar mode of applying gutta percha as a substitute for the leather and roller cloth used for the purpose of covering the top rollers of spinning machines.

[Printed, 3d.]

A.D. 1855, February, 12.—N<sup>o</sup> 325.

BARR, DAVID.—"A new or improved tap for hot and cold fluids, steam and gases."—*This invention received provisional*

544 INDIA RUBBER AND GUTTA PERCHA :

*protection, but notice to proceed with the application for Letters Patent was given within the time prescribed by the Act.*—It consists of “a plug tapered down at one end,” and “fitted or ground in a cylinder or barrel as a substitute for the ordinary valve.” “The recess or cavity for the plug is lined with vulcanized india rubber, leather, or other similar substance, and a layer of the same is attached to the top of the plug, so as to cover over the passage or outlet,” in addition to a spring “when the pressure does not sufficiently close the tap.”

[Printed, 3d.]

A.D. 1855, February 15.—N° 341.

MOLESWORTH, ROBERT.—“Improvements in the construction of brushes.” These are, making “the handle and block of the brush of one piece of wood,” &c., and making the part “of the block next the handle cylindrical while the part to which the bristles are attached is a truncated cone with the base towards the outer or brush end;” “for the purpose of more effectually binding the bristles to the block,” a casing, which may be of metal, wood, leather, or gutta percha, made smaller at the brush end than where it is attached to the block, is to be “passed over the bristles and attached to the cylindrical portion of the block by screws or otherwise.”

[Printed, 5d.]

A.D. 1855, February 16.—N° 353.

MANEGLIA, FORTUNATO GAETANO PIETRO MARIA VITTORIO.—“Improvements in railway carriages.” These consist “in connecting the bodies of railway carriages with the frame (to which the wheels and axles are attached) by means of levers, which are arranged so that the weight of the body compresses discs of vulcanized india rubber contained in a tube and separated from each other by discs of metal;” and in a similar manner “the traction hooks are arranged so that the strain thereon is caused to compress discs of vulcanized india rubber, also contained in tubes and separated from each other by metal discs, and the same arrangement of elastic discs receive the

“ shocks on the buffer through the buffer rod, which compresses the discs within the tube.”

[Printed, 10d.]

A.D. 1855, February 16.—N° 355.

WRIGHT, SAMUEL BARLOW, and GREEN, HENRY THOMAS.—“Improvements in the manufacture of encaustic tiles.” These consist in “causing the clay to be expressed through a suitable die in the form of a sheet (as has heretofore been practised in the manufacture of other tiles), which is received on to a tray or surface as it moves past the expressing machine, such tray having sides of vulcanized india rubber moving at a like speed. The sheet of clay in its movement passes under and is acted on by a roller made with a suitable surface to produce the desired pattern to the surface of the sheet of clay, which, after passing from the roller, has the hollow parts of the pattern filled up with fluid clay or slip from suitable vessels.” “The clay is cut into tiles, and the excess of clay is afterwards scraped off or removed from the surfaces of the tiles. The tiles, when partially dried, are passed under a revolving scraper or surfaces, and afterwards faced by a revolving polisher. When dry and ready for the oven, they are made true square and slightly undercut at the edges by a revolving stone or grinding surface previous to firing.”

[Printed, 1s.]

A.D. 1855, February 24.—N° 410.

JOHNSON, JOHN HENRY (*a communication from Newell A. Prince*).—“Improvements in fountain pens.” These relate “to the general form and arrangement of fountain pens, whereby they are rendered more efficient when in action, and less liable to corrosion from the action of the ink, since it is proposed to manufacture them principally of hard vulcanized india-rubber,” &c., &c.

[Printed, 7d.]

A.D. 1855, February 28.—N° 448.

PENNEY, HENRY.—“An improved mode of treating vulcanized or cured india rubber.”—This invention is void by reason of the

546 INDIA RUBBER AND GUTTA PERCHA:

*patentee having neglected to file a specification in pursuance of the conditions of the Letters Patent.*—It consists as follows:—"Cut up the material into small pieces, and steep it in coal tar, naptha, or other solvent of india rubber, in order to swell it. When the material has thus been deprived of its elasticity, remove it from the naptha or other spirit and drain or dry it; next, submit it to heat, and thereby reduce it to a fluid state. When the naptha has been completely driven off, add to the fluid material a small quantity of spirits of turpentine or other spirit, which is then volatilized by the heat."

[Printed, 8d.]

A.D. 1855, March 2.—N° 464.

HODGES, WILLIAM.—"Certain improvements in boots and shoes." These consist "in inserting into the upper leather, cloth, &c. of the boot a continuous piece of india-rubber web or other elastic material extending from one side of the boot across the front to the other side of the boot," &c.

[Printed, 8d.]

A.D. 1855, March 3.—N° 469.

WOODLEY, JOHN and SWINFORD, HENRY HERBERT.—"Improvements in apparatus for indicating and giving alarm in cases of fire;" these relate to "a peculiar application of gutta percha tubing or similar tubing charged with compressed air or gas, and communicating with the several parts of ships, dwelling houses, or other places to be protected thereby, and which tubes, being connected with a suitable alarm, and dial or index, they thereby indicate the locality of accidental fire." The arrangement of the tubes is described, and "when any one of the gutta-percha tubes is ruptured by heat, the air escaping disengages the alarm by the collapsing of a vulcanized disc or ball," &c.

[Printed, 8d.]

A.D. 1855, March 5.—N° 483.

PAINE, LEWIS JAMES, and RYAN, JOHN.—"Improved portable utensils, such as buckets, canteens, baths, and other similar

“waterproof articles for containing liquids; also applicable for portable life boats, buoys, or land marks, and other compressible articles;” this consists “in forming vessels and other articles of india rubber or other suitable material, and making the same compressible and self-distending or elongating by means of a spring or springs or expanding ribs.” These springs are made by coiling spring wires, tempered or untempered, upon a suitable block or model, and having the required form or dimension; and cover or encase the same with the india rubber, &c.

[Printed, 3*d*.]

A.D. 1855, March 6.—N° 494.

HYDE, WILLIAM.—“Improved marine life-preserving apparatus,” “sufficiently buoyant to float as many persons as it will contain, its component parts being so made and put together that when not required for life-preserving purposes, they may be used as packing cases, trunks, lockers, arm chests, or other articles of ship furniture.” These consist of several cases, made watertight, and “they are connected together by transverse and vertical bolts” having india-rubber washers under their heads and nuts, the number and position of these bolts depending on the size of the apparatus, and the number of cases and other parts of which it is to be composed.

[Printed, 6*d*.]

A.D. 1855, March 7.—N° 502.

KENNEDY, JOHN.—“Improvements in the manufacture of boots and shoes.” These are, first, using “an apparatus for making boots and shoes, instead of the lapstone and squeezer,” made of two pieces of wood or metal or other suitable material fixed to a bench,” and turning “on a pivot with a tube and strap, so that the work will be done without subjecting the operator to premature disease by the crippled position of the body as at present.” Second, “the use of metal pins, nails, or rivets, in conjunction with metal lasts.” Third, “the use of metal plates and chisels to cut soles and insoles.” Fourth, “the use of metal heels with top pieces of leather, gutta-percha, or other similar material.”

[Printed, 7*d*.]

A.D. 1855, March 7.—N° 506.

JOHNSON, JOHN HENRY (*a communication from Charles Morey*).—“Improvements in the manufacture of hard india rubber and of articles composed of that material.”—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists in “hardening the soft india rubber or articles composed of soft india rubber by immersing them in a bath of melted sulphur contained in an open vessel.” “Should the color or elasticity of the articles require modifying, a little shellac, lamp black, oxide, or other substances may be incorporated with the soft caoutchouc during its preparation.”

[Printed, 3d.]

A.D. 1855, March 9.—N° 527.

WHITE, GEORGE (*a communication*).—“Improvements in the treatment of horn, and other substances of a similar nature.”—*This invention did not proceed to the Great Seal.*—It consists in the incorporation of horn or horny substances with india rubber, gutta percha, or both of them, with or without the adjunction of other suitable materials,” producing a product which may serve for various useful and ornamental purposes.”

[Printed, 3d.]

A.D. 1855, March 9.—N° 531.

MURDOCH, JAMES (*a communication*).—“An improved method of enlarging or reducing designs, maps, and other similar articles, also apparatus or machinery to be employed in the same.” First, by “transferring the design to a sheet of caoutchouc (or other suitable elastic material), and then stretching the material equally in all directions, and the reducing such designs by transferring them to a sheet of caoutchouc (or other suitable elastic material) previously equally stretched in all directions, and then allowing the material to shrink or contract equally in all directions.” Second, “the apparatus” “for stretching the elastic material, and for making transfers of the design to or from the elastic material.”

[Printed, 7d.]



A.D. 1855, March 12.—N<sup>o</sup> 551.

MOSLEY, GEORGE.—“An improvement in buttons.”—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists, “in making the shanks of “ glass, agate, or other buttons of an elastic material; the material preferred is “ india rubber covered with silk or other fibrous “ substance;” “ short pieces of this elastic cord or thread are “ passed through a hole made in the centre of the button, and “ cemented therein; a small stud or bead is fastened or cemented “ in the hole upon the upper or outside of the button, so as to “ close or conceal the orifice.”

[Printed, 3d.]

A.D. 1855, March 14.—N<sup>o</sup> 577.

GOODYEAR, CHARLES, junior.—“Improvements in the plates “ of artificial teeth.” Making them of “india rubber and gutta “percha compounds, combined with sulphur,” and “whilst in the “ moulds ” causing “the materials and the moulds to be subjected “ to heat for about six hours ” gradually raising “ the heat up to “ about 230° of Fahrenheit, say, in about half an hour, and then, “ unless there be a considerable quantity of foreign matter present, “ the heat may be raised as quickly as may be to about 295° of “ Fahrenheit,” &c.

[Printed, 3d.]

A.D. 1855, March 19.—N<sup>o</sup> 616.

HODGES, RICHARD EDWARD, and MURRAY, CHARLES.—“Improvements in door springs,” as follows, “ a lever is fixed on “ the door, a short chain, strap, or cord is attached at one of its “ ends to the door frame, and at its other end to the outer part of “ the lever. To the same end of the lever is also attached a spring, “ by preference of vulcanized india rubber, and the other end of “ the spring is attached to the door.” When the door opens in “ two directions then the two levers and two springs are used,” &c., and to “ the outer end of each lever is attached a spring, by “ preference of vulcanized india rubber, and the other ends of “ these springs are attached to the frame of the door,” &c.

[Printed, 10d.]

A.D. 1855, March 7.—N° 506.

JOHNSON, JOHN HENRY (*a communication from Charles Morey*).—“Improvements in the manufacture of hard india rubber and of articles composed of that material.”—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists in “hardening the soft india rubber or articles composed of soft india rubber by immersing them in a bath of melted sulphur contained in an open vessel.” “Should the color or elasticity of the articles require modifying, a little shellac, lamp black, oxide, or other substances may be incorporated with the soft caoutchouc during its preparation.”

[Printed, 3*d.*]

A.D. 1855, March 9.—N° 527.

WHITE, GEORGE (*a communication*).—“Improvements in the treatment of horn, and other substances of a similar nature.”—*This invention did not proceed to the Great Seal.*—It consists in the incorporation of horn or horny substances with india rubber, gutta percha, or both of them, with or without the adjunction of other suitable materials,” producing a product “which may serve for various useful and ornamental purposes.”

[Printed, 3*d.*]

A.D. 1855, March 9.—N° 531.

MURDOCH, JAMES (*a communication*).—“An improved method of enlarging or reducing designs, maps, and other similar articles, also apparatus or machinery to be employed in the same.” First, by “transferring the design to a sheet of caoutchouc (or other suitable elastic material), and then stretching the material equally in all directions, and the reducing such designs by transferring them to a sheet of caoutchouc (or other suitable elastic material) previously equally stretched in all directions, and then allowing the material to shrink or contract equally in all directions.” Second, “the apparatus” “for stretching the elastic material, and for making transfers of the design to or from the elastic material.”

[Printed, 7*d.*]

A.D. 1855, March 12.—N° 551.

MOSLEY, GEORGE.—“An improvement in buttons.”—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists, “in making the shanks of “ glass, agate, or other buttons of an elastic material; the material preferred is “ india rubber covered with silk or other fibrous “ substance;” “ short pieces of this elastic cord or thread are “ passed through a hole made in the centre of the button, and “ cemented therein; a small stud or bead is fastened or cemented “ in the hole upon the upper or outside of the button, so as to “ close or conceal the orifice.”

[Printed, 3d.]

A.D. 1855, March 14.—N° 577.

GOODYEAR, CHARLES, junior.—“Improvements in the plates “ of artificial teeth.” Making them of “india rubber and gutta “ percha compounds, combined with sulphur,” and “whilst in the “ moulds” causing “the materials and the moulds to be subjected “ to heat for about six hours” gradually raising “the heat up to “ about 230° of Fahrenheit, say, in about half an hour, and then, “ unless there be a considerable quantity of foreign matter present, “ the heat may be raised as quickly as may be to about 295° of “ Fahrenheit,” &c.

[Printed, 3d.]

A.D. 1855, March 19.—N° 616.

HODGES, RICHARD EDWARD, and MURRAY, CHARLES.—“Improvements in door springs,” as follows, “a lever is fixed on “ the door, a short chain, strap, or cord is attached at one of its “ ends to the door frame, and at its other end to the outer part of “ the lever. To the same end of the lever is also attached a spring, “ by preference of vulcanized india rubber, and the other end of “ the spring is attached to the door.” When the door opens in “ two directions then the two levers and two springs are used,” &c., and to “the outer end of each lever is attached a spring, by “ preference of vulcanized india rubber, and the other ends of “ these springs are attached to the frame of the door,” &c.

[Printed, 10d.]

550 INDIA RUBBER AND GUTTA PERCHA:

A.D. 1855, March 24.—N° 649.

SCOTT, URIAH.—“Certain improvements in the construction of carriages, and of the various parts of the same.”—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists, in “constructing wheels, axles, “springs, and bearings in general” by “increasing the height of “the front axle to bring it nearer to the line of draught, and also “to raise the line of draught,” and also by a “method of intersecting the metal or other portions of the principal bearings “with india rubber or other similar elastic material, to reduce “the severity of the concussion, vibration, and noise, and thus “to increase the durability of all parts in connexion with “them,” &c.

[Printed, 3d.]

A.D. 1855, March 24.—N° 653.

CLEWE, T. F. E.—“A new construction of locomotive engines, “tenders, and railway carriages.” “A peculiar construction of “the framing of the rolling stock of railways,” also “a peculiar “arrangement of the running wheels, whereby the present axles “are entirely dispensed with, and the wheels have each a separate “and distinct movement of their own.” And “a peculiar “arrangement of caoutchouc or other springs to be used in lieu “of the present metal or steel springs.” These springs “consist “of blocks of caoutchouc or other suitable elastic medium placed “above the bearings, and contained inside wrought-iron plates.” “A short rod or spindle passes from the bearings up through “each spring, and works at its upper end in a guide hole formed “in the under side of each beam of the carriage framing.”

[Printed, 9d.]

A.D. 1855, March 24.—N° 654.

LEWIS, GRIFFITH GEORGE, and GURNEY, JOSEPH.—“An “improved construction of knapsack, convertible when required “into a bed, a litter, or a tent.” And “which admits of being “used to protect the soldier in various ways.” The knapsack in preference is constructed of “deodorized india-rubber cloth,”

and consists simply of a sheet of suitable dimensions for lapping round and covering the soldier like a blanket, to which sheet a flexible compartment for containing the soldier's kit is sewn. "The edges of the sheet are provided with eyelet holes for receiving cords."

[Printed, 6d.]

A.D. 1855, March 26.—N° 666.

BUSSON, CLAUDE ANTOINE. — "Improvements in feeding apparatuses, applicable to machines for treating textile materials."—*This invention did not proceed to the Great Seal.*—It consists, "in presenting to one side of the layer or sliver of textile materials to be acted upon a fixed rigid smooth surface, and to the opposite side of the layer, a moveable elastic surface, into which latter the materials may incrust or inlay themselves sufficiently deep for the purpose." The elastic surface is a drum covered with a layer of vulcanized india rubber, and partly surrounded by a smooth casing or covering in a concentric position, &c., &c.

[Printed, 3d.]

A.D. 1855, March 26.—N° 667.

HILL, HENRY CHARLES.—"Improvements in the manufacture of waterproof flocked cloth and other fabrics." First, preparing waterproofing material by masticating, either with or without solvents, vulcanized, and ordinary india rubber in proportions which vary according to the "pliability or softness required in the cloth," &c. to be coated. The result is "reduced to any consistency by adding naphtha, bisulphuret of carbon, camphine, turpentine, or other solvent." "In some cases" ordinary caoutchouc may be dispensed with." The cloths, &c. are coated with the preparation and "cured" by submitting them to a temperature from one hundred to three hundred degrees Fahrenheit, preferring heated air for this purpose.

Second, "Curing and rendering inodorous waterproof fabrics by means of a current or currents of heated air or steam," and "the mechanical arrangements for effecting the same." These arrangements are by induction and eduction pipes for the hot air

552 INDIA RUBBER AND GUTTA PERCHA:

or steam into a chamber in which the cloths, &c. are supported on stands, &c.

Third, perfuming the goods, by passing the heated air first through a chamber containing perfume or scent.

Fourth. "Flocking surfaces coated or covered with sulphurized, "metalized, mineralized, or other prepared india rubber or gutta "percha, combined with prepared india rubber or gutta percha."

Fifth, Preparing fibrous materials, and applying the same to the manufacture of flocked cloth, &c. The fibrous materials, such as woollen or cotton flock, ground sponge, sawdust, hair, &c., &c., are dyed, or stained, and masticated with the india-rubber compounds, and applied by a solvent to the cloth, or the flocking materials may be sifted on to prepared cloth, &c.

[Printed, 4d.]

A.D. 1855, March 27.—N° 677.

GOODYEAR, CHARLES (*a communication*).—"A new method of "moulding india rubber and gutta percha," either separate or combined together, or with other matters by forcing such matters when in a plastic state into moulds." "The machine "employed is constructed in a similar manner to the machines "now employed for coating telegraphic wires with gutta percha."

[Printed, 3d.]

A.D. 1855, March 27.—N° 679.

TURNER, ARCHIBALD.—"Improvements in the manufacture "of elastic fabrics."—*This invention is void by reason of the Patentee having neglected to file a Specification in pursuance of the conditions of the Letters Patent.*—It consists as follows:—"The india-rubber strands and non-elastic threads which form "the warp of the elastic fabric are arranged in the ordi- "nary way, but, instead of the weft threads being passed regu- "larly round all the strands, one of the outer strands of india "rubber, together with its accompanying non-elastic threads, "is bound in by only every alternate weft thread, thereby "forming a kind of false selvage between the outermost and "second elastic strand, and leaving openings to receive the "points of the needles of the knitting machine, by which the "glove or other article is intended to be made," the object is

“merely to drop occasional weft threads, so that the additional strand may be bound or attached to the elastic band by occasional wefts instead of causing every weft thread to pass round all the strands, as is now the case.”

[Printed, 3*d*.]

A.D. 1855, April, 2.—N° 733.

NEWALL, ROBERT STIRLING.—“An improvement in the standing rigging of ships and other vessels.” “Instead of using wire rope, as heretofore, made of a number of small wires laid into strands, and of strands laid into a rope, which class of ropes exposes a large surface to oxidation,” employing ropes each composed of six stout wires (which number is preferred to any other), “laid round a case of gutta percha, or of flexible water-proof composition, by which the required strength and greater durability will be obtained in standing rigging.”

[Printed, 3*d*.]

A.D. 1855, April 2.—N° 735.

FRIEND, GEORGE WILLIAM.—“Improvements in umbrellas and parasols.” These consist “in the application of a metallic coating to the ribs of those articles in the form of a tube or covering of gold, silver, copper, brass, zinc, or other metal not subject to corrosion from wet, drawn or otherwise secured upon the steel or whalebone forming the body of the rib,” &c. Also, applying “a coating of gutta percha to the ribs and stretchers of umbrellas and parasols to afford a like protection.”

[Printed, 4*d*.]

A.D. 1855, April 3.—N° 745.

CORNIDES, LOUIS.—“Certain improvements in saturating and coating or covering leather, paper, and textile fabrics, so as to render the same on the coated or covered surfaces thereof impervious to water.” First, “making a solution of explosive cotton in wood spirit, or pyroxylic acid.” Second, “combining alcoholized solution of gun cotton and the pyroxylic solution of gun cotton with resins and gums.” Third, “coating surfaces by means of such solutions with gun cotton.” Fourth, coating surfaces with india rubber or gutta percha.

554 INDIA RUBBER AND GUTTA PERCHA:

" by means of the solutions thereof, particularly described." These solutions are made as follows, "mixing 16 parts of spirits of turpentine with two or four parts gutta percha, or the following:—Sixteen parts spirits of turpentine, two or four parts gutta percha, half or one part caoutchouc, or any other composition or solution, with or without combination of gutta percha, india rubber, gum, resins, bitumen, and other flexible materials." Fifth, "the spreading on fabrics a coating of the solutions mentioned, or solutions of any substances made with aether, or volatile oil, or spirit. Also, an apparatus consisting of a close chamber, communicating with a closed drying chamber, and such drying chamber communicating with a condenser, so that the evaporated aether, volatile oil, or spirit, is not allowed to escape, but is condensed and recovered." Sixth, employing drying oils, with or without gums, or resins, or colors, fish-oil colors, tar, with or without colors, as follows:—Coat the paper, &c. with gum, &c., and when dry apply another coat, and so on till the required thickness is obtained; apply the still moist surface to the fabric, and pass them between rollers; then moisten the paper, and draw it off. Sugar and gelatine in equal proportions may be substituted for the gum. Seventh, preparing leather with a solution of gutta percha and common resin dissolved in certain proportions in naphtha, &c. Eighth, applying graphite and other metallic or mineral powders in a dry state to the coating transferred as above, "whilst such coating is in a half dry or green state."

[Printed, 10d.]

A.D. 1855, April 3.—N° 748.

FANSHAWE, HENRY RICHARDSON, FANSHAWE, JOHN AMERICUS.—"Certain improvements in the manufacture of "waterproof fabrics of vulcanized, sulphurised, or cured class." These are, "combining such fabrics with fabrics not vulcanized, "sulphurised, or cured."

[Printed, 4d.]

A.D. 1855, April 4.—N° 755.

MOUCHEL, LOUIS AMBROISE MICHEL (*a communication*).—"An improved method of joining pipes, tubes, and ducts." It consists as follows:—"The abutting ends of the pipes, &c. to be



“ jointed together are formed with flanges, the flange on one of  
 “ the ends being at right angles to the pipe, and the flange on the  
 “ other being inclined thereto, or forming, as it were, a single  
 “ thread of a screw.” “ A groove is formed in one of the abutting  
 “ ends, into which is inserted a washer of india rubber, or other  
 “ suitable elastic material; and a projection is formed on the  
 “ other of the abutting ends, which fits into the groove and  
 “ against the elastic washer.” “ A loose collar with two or more  
 “ clip hooks is fitted over the two flanges by means of a bayonet  
 “ joint.” “ When it is not convenient to form the flanges on the  
 “ ends of the pipes, &c., they may be formed on supplementary  
 “ pieces which can be fitted to the pipes, tubes, &c. in any con-  
 “ venient manner.”

[Printed, 10d.]

A.D. 1855, April 5, N° 761.

GOODYEAR, CHARLES.—“ Improvements in self-inflating pon-  
 “ toons and life-preservers.” “ The pontoon is made of india-rubber  
 “ or waterproof fabrics, in a series of compartments or chambers,”  
 “ each chamber being distinct and separate from the others.” “ The  
 “ partitions formed of a plate or panel of “india-rubber whale-  
 “ bone,” “ or stiff waterproof partition.” “ Each compartment  
 “ has a tube or passage by which the pontoon is self-inflated  
 “ when drawn out.” “ Loops or rings are attached to the  
 “ pontoons at each end of every compartment, by which they may  
 “ be fastened to spars or boats, or lashed together to form rafts  
 “ or bridges.” “ The life-preservers are made in the same way  
 “ as the pontoons, but without rings and loops to the separate  
 “ chambers.”

[Printed, 6d.]

A.D. 1855, April 5.—N° 762.

LANE, DENNY.—“ Improvements in obtaining power by water.”  
 “ These relate “ to that class of machinery wherein an endless chain  
 “ or succession of buckets is used,” and consist “ of a series of  
 “ rollers attached to a gutta-percha endless band carried by three  
 “ rollers.” “ The upper one and the lower one are placed in the  
 “ same vertical plane; and in order to adjust the position of the  
 “ lower one to the varying height of the water the axes of the

556 INDIA RUBBER AND GUTTA PERCHA:

" lower roller are capable of rising and falling in vertical grooves or slides, and the axes of the third roller are capable of moving in guides or horizontal grooves." "And in order to keep the vertical part of the gutta percha band from vibrating, one or more rollers intermediate of the upper and lower rollers may be used."

[Printed, 3*l*.]

A.D. 1855, April 7.—N<sup>o</sup> 772.

STONES, RICHARD. — "Improvements in taps or cocks for drawing off fluids." These consist "in the substitution of a cone, button, or disc valve," "for and in the stead of the ordinary plug," "such valve being acted upon or opened by the turning of a T-headed or other form of spindle in the place of the ordinary plug, such spindle having an elliptic collar, the major axis of which is considerably greater than the minor axis; so that when the smaller diameter is presented to the end of the spindle of the cone or button valve, the valve is allowed to go perfectly home into its seating, and, upon the handle being turned round one-fourth of a circle, the larger diameter of the elliptic collar is gradually pressed against the end of the spindle of the valve, and forces it open against any column of fluid or pressure behind it," &c. The spindle has a collar above the elliptic part, "ground into the barrel of the cock," and between it and the cap for covering the bore of the barrel is a washer of india rubber pressed upon by the screw cap, the use of which in connexion with the valves is claimed.

[Printed, 7*d*.]

A.D. 1855, April 11.—N<sup>o</sup> 793.

ADDISON, JOHN, and SINCLAIR, DUNCAN.—"Improvements in the manufacture of bayonet scabbards, sword scabbards, pistol cases, and holsters."—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists as follows:—Instead of using leather, making "use of gutta percha, which enables the above articles to be manufactured without a seam and at much less cost."

[Printed, 3*d*.]

A.D. 1855, April 11.—N<sup>o</sup> 797.

FLETCHER, JAMES.—“Improvements in and applicable to machines for spinning and weaving cotton, wool, and other fibrous materials.” In the provisional specification the invention relates, first, to a means of collecting, cleaning, or clearing from the top of the carriage and the face of the roller beam, “fly,” or short fibres,” &c., and “it consists of a combination and arrangement of two clearers or rollers,” &c. Second, “preventing threads that break in spinning from becoming entangled with the adjoining threads,” by “substituting a comb or equivalent arrangement in place of the wire of the counter fuller,” &c. Third, “in power looms,” “forming the shuttle guard, so that that portion of the strap passing between one end of the picker spindle and the other may pass through a cavity formed in the shuttle guard, and, if required, be acted upon by the force of a spring arranged in the shuttle guard, to give the friction which acts as a retarding force upon the strap.” Fourth, applying “india rubber, or a compound of india rubber and cloth, leather, or other fabric, to accomplish the purpose of the strap before referred to;” “each end of the strip of india rubber being attached to pieces of strap that pass on to the spindle, the strip of india rubber being secured to the shuttle guard or box.” Fifth, applying “tubes, hollow spheres, or other suitable forms of india rubber, or a compound of india rubber with leather, cloth, or other substances, placed upon the picker spindle to act as buffers, to break the force of the pickers at each end of the spindle.”

In the complete specification it is stated that certain parts described above have been discovered not to be useful, and are not claimed, namely, those under the first, third, fourth, and fifth heads.

[Printed, 7d.]

A.D. 1855, April 16.—N<sup>o</sup> 834.

HOLMES, HENRY.—“Certain processes of treating the human body by gases, vapors, and electricity, and for certain apparatus for obtaining and applying the said gases, vapors, and electricity to the above or any other processes.”—*This invention did not proceed to the Great Seal.*—It consists, first, “in partial or

558 INDIA RUBBER AND GUTTA PERCHA:

"entire immersions of the body" in gases, &c., "while the electrical condition of the body is, if necessary, suitably modified." Second, in apparatus for carrying out of the above, in connection with which tubes of india rubber or gutta percha, "especially of the vulcanized gutta percha" patented "by William and James Ryder," are employed. It is preferred to use these substances in other parts of the apparatus.

[Printed, 3d.]

A.D. 1855, April 17.—N° 844.

CRAPELET, CHARLES.—"Improvements in the construction of tompons for cannon and other fire-arms, which improvements are applicable to stopping bottles and other vessels." These consist, in introducing into the orifice to be closed a plug of vulcanized india rubber, or other suitable elastic substance, in such a manner that the plug "may, after insertion be compressed longitudinally by means of a screw, or otherwise, and in this manner the diameter of the plug is increased until it tightly fits the orifice." Several modes, modifications of the following, for doing this, are described. A screw upon which is fitted a ring of vulcanized india rubber; over this rubber and upon the screw is a piece of metal with a shoulder, which comes in contact with the end of the barrel, when the above arrangement is placed in it the screw head inwards; a nut now screws on to the end of the screw, and compressing the piece of metal, it presses upon the india-rubber ring, bulging it out, and making a perfectly tight joint."

[Printed, 5d.]

A.D. 1855, April 18.—N° 855.

JOHNSON, JOHN HENRY (*a communication*).—"Improvements in machinery or apparatus for moulding and casting fusible or plastic materials, and in covering or coating articles with such materials."—*This invention did not proceed to the Great Seal.*—It consists as follows:—"The india rubber, if such be the material employed, is contained in a horizontal cylinder, and is kept in a melted or plastic state therein, by means of a steam or hot-water jacket round such cylinder." "The plastic or melted india rubber is forced out of one end of the cylinder into any suitable mould,

" by means of a piston or plunger, on the end of a screwed shaft  
" or piston rod, which rod works through a fixed nut, and is  
" rotated by a suitable fly wheel," &c., &c.

[Printed, 3d.]

A.D. 1855, April 19.—N° 875.

JOHNSON, JOHN HENRY (*a communication*).—"Improvements  
" in the manufacture of articles of hard india rubber or gutta  
" percha, or compounds thereof, and in coating or covering articles  
" with the like materials." These relate to the manufacture of  
certain articles, after the methods described in N° 9952, N° 11,135,  
N° 1819, 1854, and N° 855, 1855.—The articles are as follows:—  
" Handles for brushes, knives, razors, swords, canes, and um-  
" brellas, snuff boxes, necessaries for ladies' work, combs, bottles,  
" book covers, small rollers and wheels used in spinning and  
" weaving, cones for shuttles and shuttles themselves, tubing of  
" all kinds, opera and spying glasses, spectacles and eye glasses,  
" flutes and other musical instruments, clocks, ships' pullics,  
" horse shoes, ornaments for furniture, statues and statuettes, taps  
" and fawcettes, buttons, sword and bayonet sheaths, and vizors,  
" candlesticks and clamps, bobbins, compasses, haversacks, knap-  
" sacks, coffins, letters for signs, pistol holders, rollers or castors  
" for furniture to run upon, inkstands, cockades, penholders and  
" pens, picture and other frames, knobs for doors and furniture,  
" powder pouches, cartouch boxes, trunks, and portmanteaus,  
" wash basins, and water and other pots, tobacco pipes, type and  
" stereotype, vases of every form, whips, fans, dominoes, and  
" chess and draughtsmen, jewellery, such as rings, chains,  
" brooches, &c., buckets for water, acids, and other corrosive  
" liquids, and toys," &c., &c.

[Printed, 4d.]

A.D. 1855, April 21.—N° 893.

SCHOOFS, HENRI.—"Improvements in making, fixing, or  
" attaching artificial teeth, gums, and palates." These are  
" having for their base gutta percha or caoutchouc employed  
" separately or mixed together, or modified with other gums  
" when so employed." These substances are applied in layers

560 INDIA RUBBER AND GUTTA PERCHA :

to the arrangement of teeth made to supply the deficiency "on  
" all the corresponding parts near the impaired maxillary roof or  
" palate." "To place the 'piece' or apparatus in the mouth,  
" that part which is to adapt itself to the maxillary palate or  
" roof is warmed, and, being softened by the heat, it is adjusted  
" in its proper place."

[Printed, 3d.]

A.D. 1855, May 2.—N° 984.

HARROLD, FREDERICK WILLIAM (*a communication*).—"An  
" improvement or improvements in the manufacture of frames of  
" slates used for writing on." This consists in making these  
frames "of one strip of wood, cane, gutta percha, metal, or  
" other suitable substance." These are first bent over a model  
of the size and shape of the slate to be framed.

[Printed, 5d.]

A.D. 1855, May 4.—N° 1001.

TROTMAN, JOHN.—"Improvements in the manufacture of  
" screw and other submerged propellers."—*This invention received  
provisional protection, but notice to proceed with the application  
for Letters Patent was not given within the time prescribed by the  
Act.*—It consists in the use "of gutta percha or a compound  
" thereof, or of india rubber compounded with sulphur and  
" changed by heat, in the constructing or making of screw and  
" submerged propellers, and thus to obtain lighter and at the  
" same time strong and elastic propellers."

[Printed, 3d.]

A.D. 1855, May 5.—N° 1006.

BUTCHER, MATTHEW, and NEWHEY, THOMAS HENRY.—  
"Improvements in forge hammers." These are said to be several,  
and one is said to be "the use of washers of vulcauized caoutchouc  
" and wood, under the chairs of forge hammers, for the purpose  
" of diminishing the action of the hammers thereon."

[Printed, 7d.]

A.D. 1855, May 10.—N° 1053.

NEWTON, ALFRED VINCENT (*a communication*).—"An improved mode of preparing colour for printing and staining fabrics." This consists in using "liquid uncoagulated caoutchouc, whether mixed or uncombined with other substances, as a vehicle for the application of coloring matter and the means of rendering it more or less liquid," by evaporation, or by gums &c. (thickeners).

[Printed, 3*d*.]

A.D. 1855, May 12.—N° 1072.

ADAMS, WILLIAM BRIDGES.—"Improvements in the construction and propulsion of vessels for navigation moved by internal power." These are several, and one is said to be in applying caoutchouc, vulcanized or otherwise, "for the purpose of giving elastic yielding and reaction to paddle wheels and propellers or toothed wheels," or "the application of volute, or spiral, or disc, or hoop springs of steel for the same object."

[Printed, 11*d*.]

A.D. 1855, May 15,—N° 1098.

FAWCETT, WILLIAM, LAMB, JOHN, and FAWCETT, FRANCIS BEST.—"Improvements in the manufacture of carpets and other similar fabrics, and in machinery and apparatus to be used therein." Among these improvements, which are several, one is as follows :—In order "to lessen the great wear and tear of the harness cords" in jacquard looms, "to which the mails and lingoes are affixed, and render them more durable," substituting "for the ordinary cords or bands, cords of gutta percha."

[Printed, 1*s*. 11*d*.]

A.D. 1855, May 17.—N° 1116.

JOHNSON, WILLIAM (*a communication*).—"Improvements in the manufacture, treatment, and application of oily, resinous, and gummy substances and soaps." One of the objects of this

562 INDIA RUBBER AND GUTTA PERCHA:

invention is to produce substances which resemble gutta percha and caoutchouc. For this purpose the oils from distilling resin are mixed with albumen, fibrine, caseine, starch, &c., &c. A compound resembling leather is made of rosin oil, olive or linseed oil, turpentine, catechu, starch, all mixed in certain proportions, and "the mass so produced is then mixed with hot gutta percha." Other compounds are produced.

[Printed, 4d.]

A.D. 1855, May 21.—N° 1130.

NICHOLLS, BENJAMIN.—"Improvements in the manufacture " and construction of buttons." These are "making buttons " from gutta percha." "The forms of the buttons, and modes of " attaching them, are various," as also the ways in which they may be formed; but this is generally done "by the action of a " powerful press."

[Printed, 3d.]

A.D. 1855, May 21.—N° 1132.

STOCKER, SAMUEL.—"Improvements in machinery and apparatus for shaping of metals, and also in such metal goods made " from sheets, plates, or tubes, and also for other parts connected " therewith, and for finishing the same when left by the machine " or apparatus." In these improvements one is in making of " unions or pipes" used "for connecting two or more pipes or " parts together," and "to make all sound or tight, a leather " washer is usually screwed between the parts for that purpose;" but now it is intended to use "gutta percha or other suitable " material."

[Printed, 7d.]

A.D. 1855, May 21.—N° 1139.

SILBERMANN, IGNACE JOSEPH.—"Improvements in printing " on any kind of surfaces." These are producing a pressure by air, gas, steam, or a liquid," "in the interior part of a recipient or " holding capacity made wholly or partly elastic, for the purpose



AIR, FIRE, AND WATER PROOFING. 563

“ of inking or printing on any surfaces either curved or plain.”  
 “ In printing celestial or terrestrial globes,” two hemispheres of copper or steel, &c. are employed, having “ the required figures engraved in their interior surfaces,” and when the inking is properly effected, “insert through the polar opening of one of the two hemispheres, the globe” in a collapsed state to be printed, and secure it there; then expand it, “by admitting compressed air, steam, gas, or any fluid.” The elastic globe may be made of caoutchouc, gutta percha, &c. For printing on plain surfaces the apparatus for communicating the pressure is “a box or vessel of a hard substance,” “one side of which may be made of vulcanized caoutchouc,” &c., which is expanded by air, gas, &c. in the interior. For the purpose of inking, the surface is caoutchouc, plane, curved, spherical, or cylindrical, as required,” and “the pressure is obtained by the same means above described.”

[Printed, 3*d*.]

A.D. 1855, May 21.—N° 1146.

MURTON, JOHN MAHON.—“Improvements in sister-hooks and thimbles for ships’ and boats’ riggings, such improvements or parts thereof being applicable also to other purposes where hooks are required.” In these improvements relating to the above matters one is said to be “in the application and use of an india-rubber washer placed on one or both sides of the joints of sister hooks,” whereby “the hooks may be made to move sufficiently tightly on their pivots or joint pin, and still not be liable to set fast.”

[Printed, 7*d*.]

A.D. 1855, May 21.—N° 1149.

JOHNSON, JOHN HENRY (*a communication*).—“Improvements in the process of vulcanizing and rendering hard, india rubber and gutta percha, and in the application of those materials, when hard, to the construction of parts of machinery or apparatus employed in the preparation and manufacture of fibrous materials and textile fabrics.” These are, “the vulcanizing

“ and rendering hard sheets and articles of india rubber and gutta percha upon surfaces of glass, either engraved or plain, whereby a highly ornamental or polished surface will be imparted to the india rubber or gutta percha during the process of vulcanizing and hardening the same;” “ the construction of the bobbins and rollers or beams used in spinning and carding machines;” “ of the rollers or cylinders, whether fluted or otherwise, used in drawing and roving frames and mules;” “ of mule carriages;” “ of the ravels, reeds, and hecks used in sizing and warping mills;” “ of weavers’ reeds;” “ of cards for jacquards;” “ of the combs or hecks and guide eyes employed in silk-winding machines and throwing mills, and in doubling and winding frames for silk and other fibrous substances;” “ of shuttle and heddle eyes;” “ of the needles, hooks, cylinders, and spring boxes used in jacquard machines;” “ of the spindles and flyers used in spinning and roving frames;” “ of the funnel, bell, or trumpet mouths used for guiding threads or slivers of fibrous materials;” “ of the sheets used in hot and cold pressing, and the rollers of callendering machines, of hard india rubber or gutta percha.”

[Printed, 4*d.*]

A.D. 1855, May 23.—N<sup>o</sup> 1161.

DAVIS, DAVID L.—“ An improved method of applying elastic bearings to railroad chairs and rails.” This consists “ in confining the india rubber between plates upon every side in such a manner, that while it shall be free to yield in a vertical direction, it shall be subjected to no friction between the surfaces above and below it, by which means the india rubber is protected from the abrasion which has heretofore so speedily destroyed it.”

[Printed, 7*d.*]

A.D. 1855, May 25.—N<sup>o</sup> 1187.

HENSON, HENRY HENSON.—“ An improvement in the manufacture of fabrics suitable for goods’ wrappers and other purposes for which canvas has been or may be employed.” This

"improvement is based upon an invention for which Letters Patent were granted" to the patentee Nov. 5, 1846 (N° 11,438), "which consisted mainly in the manufacture of a fabric composed partly of wire and partly of hemp, or other similar fibrous materials." This "consists in coating or covering such wires before being woven into a fabric together with hemp," &c. with india rubber, gutta percha, &c.

[Printed, 3d.]

A.D. 1855, May 26.—N° 1204.

METHVIN, DAVID.—"Improvements in the manufacture of stoppers for bottles and other vessels."—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists in "forming a stopper for a bottle or other vessel of a hollow or tubular form of vulcanized india rubber, cork, or other suitable material." "This stopper has a cone to enter at the end, which passes into the neck or opening of the bottle or vessel. The cone is acted on by a screw and nut or other instrument in such manner as to move the smaller end thereof into the end of the hollow or tubular stopper, which will cause the stopper to be enlarged in diameter."

[Printed, 3d.]

A.D. 1855, May 28.—N° 1220.

SALT, THOMAS PARTRIDGE.—"Improvements in the construction of artificial legs."—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists "in substituting for the complicated mechanisms employed for obtaining the movements in an artificial leg a cord of vulcanized india rubber or other equivalent elastic material, which is secured to certain fixed points, and passes over friction rollers under the knee and at the instep of the foot, a check-string of cat-gut or other similar material being employed as usual."

[Printed, 3d.]

A.D. 1855, June 4.—N° 1268.

GODEFROY, PETER AUGUSTIN.—“Improvements in the treatment of gutta percha.” These consist “in combining the shells of the fruit of the cocoa-nut tree (*cocos nucifera*) in a finely ground or comminuted state with gutta percha,” by which considerable “economy” is obtained, as well as “durability,” and “it will stand a greater degree of heat, and is considerably more elastic.”

[Printed, 3d.]

A.D. 1855, June 5.—N° 1280.

COFFIN, DAVID NEWELL BROWN, Junior.—“A new and useful improvement in self-closing stopcocks.” This consists in the application of elastic packing,” that “shall perform the two duties of packing the valve stem, and constantly pressing the valve towards its seat.” “A vulcanized india-rubber packing” is described as having been tried.

[Printed, 8d.]

A.D. 1855, June 9.—N° 1317.

TEAGUE, HENRY.—“Improvements in high and low pressure meters for water, gas, or any other fluid.”—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists “in placing between two hemispherical segments an elastic diaphragm composed of india rubber or any other suitable elastic material.” “When the two hemispherical segments are bolted together with the diaphragm between them they form a spherical chamber or vessel, into which chamber the water, gas, or fluid to be measured is admitted and discharged by a four-way cock or cocks, slide or valve.” “This cock is connected with a weight attached to a fork, which is actuated by a rod working through a stuffing box in the spherical vessel, and connected with the diaphragm. This rod raises and carries the weight on the cock beyond a vertical position, when it falls by its own gravity, and reverses the position of the cock, thus admitting the fluid alter-

“ nately on each side of the diaphragm.” “ This same rod also  
“ works a register, which indicates the quantity of fluid that  
“ passes through the meter.”

[Printed, 3d.]

A.D. 1855, June 18.—N° 1389.

MYERS, EDWARD.—“ Improvements in machinery or apparatus  
“ for raising water or other liquids.”—*This invention did not  
proceed to the Great Seal.*—It consists “ in the application and  
“ use of a pair of toothed or fluted drums gearing into each  
“ other, and rotated by hand or power inside a suitable chamber  
“ formed in the suction pipe.” “ The edges of these drums  
“ which bear against the inside of the chamber may be formed of  
“ vulcanized india rubber or other material of a similar nature, or  
“ the drums may be formed altogether of some hard substance,  
“ and may bear at their outer edges against an india-rubber lining  
“ fitted inside the chamber.”

[Printed, 3d.]

A.D. 1852, June 21.—N° 1420.

RIOUX, PIERRE FRANCOIS, and DE PARIENTE, LEON (*a  
communication*).—“ Improvements in the fixing of metallic orna-  
“ ments upon paper, flock, leather, cotton, silk, or any other  
“ fabrics to which such ornaments may be applicable.”—*This  
invention received provisional protection, but notice to proceed with  
the application for Letters Patent was not given within the time  
prescribed by the Act.*—It is as follows :—Place the article “ upon  
“ an elastic or flexible bed,” “ made of vulcanized caoutchouc, or  
“ any other material which will bear heat;” “ then press the  
“ blocks, cylinders, or dies of metal, upon which are engraved  
“ the designs to be represented,” “ upon the fabric, giving the  
“ fabric a slight impression of the design;” “ then place upon  
“ the part where the design has been so printed dry albumen in  
“ powder, gum lac, and rosin, each in powder, spirit varnish,  
“ or copal varnish, or any other suitable body that will cause  
“ the metallic surface to adhere,” and place the metallic leaf over  
“ the powder or varnish so put on, and dab it down.” “ The

568 INDIA RUBBER AND GUTTA PERCHA :

“ block, cylinder, or die is now again pressed over the surface in the same place it was in the first instance, and the design is fixed upon the fabric.”

[Printed, 3*d*.]

A.D. 1855, June 23.—N° 1440.

SOREL, STANISLAS TRANQUILLE MODESTE.—“ A machine for applying adhesive matters on stuffs, and also for applying on the said matters other substances or stuffs.” “ The essential principle of this machine consists in the employment of a sheet of vulcanized caoutchouc or other analogous substance, capable of supporting a high temperature, and resisting the action of the solvents of caoutchouc and gutta percha, and serving to spread the composition in regular coats upon the tissues;” “ the tissue passes between the sheet of caoutchouc and a hollow metal cylinder, which moves on its axis, and may be heated by steam. The sheet of caoutchouc is placed in a groove formed lengthwise in a hollow piece of metal, which may also be heated by steam. This piece of metal is placed above and parallel to the cylinder above noted.” “ The composition to be employed is placed near this piece of metal, so as to be softened by the heat, when intended for use in the warm state. On moving forward the tissue to be coated, the composition adheres to it, while the sheet of caoutchouc only allows the requisite quantity to pass. When it is wished to apply a second tissue or other substance upon the coating thus formed, it is applied to the composition as the coated tissue egresses from the caoutchouc sheet.” “ By this machine can be applied to tissues, coatings in the hot or cold state, of caoutchouc, in solution, or mixed with other substances, particularly with gutta percha, pitch, resinous and fatty matters, mineral powders, &c., &c. ;” and “ cloth shearings or flocks, hair, bristles of animals, and all kinds of textile matters, more or less divided, wood, cork, and leather in powder, pulverized graphite, or black lead, metallic and earthy powders, and all kinds of sand, &c.”

[Printed, 11*d*.]

A.D. 1855, June 23.—N° 1445.

SILBERMANN, IGNACE JOSEPH.—“A new system of manufacturing globes, and other printed, plane, or curve surfaces.” It consists, first, “in using curve or plane moulds, and of such substances as can be etched, engraved, or embossed.” Second, “in inking the engraved surface with common printers’ ink for obtaining a plain print, or with indelible inks, proof against heat, when the printed surfaces are to be baked or moulded in the heated state.” Third, “in moulding or casting the matters to be printed on the engraved inked surfaces.” Fourth, applying the above “to the manufacture of every article with plane or curve surface, such as spheres, geographic and ouranographic maps, sugar articles, and other ceramic productions, as wax candles, labels for glass, pipeclay, pasteboard, enamelled papier maché articles, and also to ornamenting the inside walls of an apartment.” And likewise to “all matters that are capable of being moulded either in the cold or heated state, such as cement, plaster, terra-cotta, porcelain, glass, stearine, wax, soap, resins, sealing-wax, vulcanized hardened caoutchouc, gutta perch, horn, shell, gelatine, &c.”

[Printed, 3*l*.]

A.D. 1855, June 26.—N° 1459.

BONNET, BENOÎT.—“Improvements in weaving.” These are, substituting for the weights usually employed for keeping the warp threads stretched in the Jacquard loom, “a series of looped threads of vulcanized india rubber;” these are attached to “the harness or healds through which the warp threads pass,” and they “pass through an adjustable board,” “fixed to the framework of the loom, and they are there confined by threads or wires” “passing through the loops.”

[Printed, 5*l*.]

A.D. 1855, July 11.—N° 1555.

BIELEFELD, CHARLES FREDERICK.—“Improvements in the manufacture of saddle-trees.” These consist in the application of certain matters for making saddle-trees. These matters are

570 INDIA RUBBER AND GUTTA PERCHA:

combined in various proportions, and "may be used alone, or " may be spread" on "strong canvass." The matters to be combined may consist of "tanogelatin, sulphur balsam, gum " thus, and gutta percha, with a suitable solvent of gutta " percha, preferring Venice turpentine for such purpose." " When using strong canvass, the compound of tanogelatin " and gutta percha is what is preferred." " When thick- " ness and lightness are desired, in addition to the canvass, " sheets of cork or shaped cork may be inclosed in the canvass " and composition." The plastic compound, having been roughly formed by hand or by pressure, is, whilst hot, introduced into the mould and well pressed therein, and, when set, it is to be removed and dried.

[Printed, 3d.]

A.D. 1855, July 13.—N° 1571.

BOUSFIELD, GEORGE TOMLINSON.—"Improvements in the " manufacture of boots and shoes." These are, in making a last, as follows:—Cover the foot tightly "with a sort of gaiter," take a cast of the foot so covered in plaster of Paris; run melted gutta percha into this mould; lengthen this last by gutta percha, so as "to allow the toes room." "Cut the last into two parts for shoes, " and three parts for boots." "These pieces are kept in their " place by means of a screw."

[Printed, 3d.]

A.D. 1855, July 13.—N° 1576.

BROOMAN, RICHARD ARCHIBALD (*a communication*).—"An " improvement in pumps."—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—"It " consists "in making the barrel, piston, valves, and passages of " pumps of gutta percha, solidified caoutchouc, or other similar " material." "Pumps so constructed are especially applicable for " lifting and forcing corrosive fluids, as the gutta percha will " resist their action."

[Printed, 3d.]



A.D. 1855, July 17.—N° 1599.

PIDDING, WILLIAM.—“Improvements in coverings for the “feet of bipeds and quadrupeds.” These are, manufacturing the soles of shoes for quadrupeds, and the soles and heels of boots and shoes for bipeds, “of caoutchouc or a compound thereof with “gutta percha.” These soles and heels are so constructed as to have cells or reservoirs for “air, gas, or liquids” hermetically closed. The area of the sole is enlarged by having the cells open, stretching them and filling them with gas, &c., and attaching a sheet for the tread. The treading surface may have hardened steel studs inserted in the caoutchouc, or, when cells are not required, “angular shaped studs made of wood, glass, metal, papier maché, “gutta percha,” &c. For horseshoes, uppers are made of caoutchouc extending “as high as the top of the hoof.” Heels of shoes may be made partly combined with “springs of tempered “metal.”

Printed, 3d.]

A.D. 1855, July 17.—N° 1600.

PIDDING, WILLIAM.—“Improvements in the manufacture of “building materials.” In these improvements relating to the above subject one is said to be in putting together pieces of pipe made of slate, glass, or other materials in lengths, “luting, “filling, or cementing the edges and ends of the several portions “or pieces forming the angular pipe with caoutchouc, gutta percha, “or a combination of both, during the putting together of the “various pieces.”

[Printed, 3d.]

A.D. 1855, July 19.—N° 1635.

JOHNSON, JOHN HENRY (*a communication from Henri Victor Wacrenier*).—“Improvements in the manufacture of reeds for “weaving, and in the machinery or apparatus employed therein.” These are first, “the manufacture or construction of weavers’ “reeds, ravels, and comb bars of hard india rubber or gutta “percha.” Second, “the manufacture of the reeds and shuttle “boxes of ribbon looms of hard india rubber or gutta percha.”

572 INDIA RUBBER AND GUTTA PERCHA:

Third, "the peculiar construction and arrangement of machinery or apparatus for cutting the dents of weavers' reeds." Fourth, "the peculiar arrangement of a series of straight saws combined together for cutting the dents of weavers' reeds." Fifth, "the peculiar arrangement of a series of circular saws combined together for cutting the dents of weavers' reeds." The machinery employed in cutting the reed dents "contains a shaft, on which is fitted a small circular saw rotated at a great velocity. A sliding table or bed carrying the india rubber to be dented works on the fixed framing of the machine immediately in front of the saw." "This slide is made to move both laterally by a ratchet arrangement, for the purpose of bringing a fresh portion in front of the saw after each dent is cut, and longitudinally, by means of a cam, for the purpose of bringing the india rubber up to the saw as fast as it cuts through the material." "As the saw is made extremely thin, and the cut required to be very even and accurate, it is guided or steadied by rotating between fixed fingers or guides." "In using straight saws" a number "are fixed into a suitable box or frame, with washers between each saw to afford space to the thickener of the dents. The india rubber is laid on or against this series of saws, and, being slightly pressed thereon, it is rubbed transversely across the box or frame, whilst the saws therein effect the cutting of the whole or a portion of the dents simultaneously."

[Printed, 10d.]

A.D. 1855, July 21.—N° 1654.

GOODYEAR, CHARLES.—"Improvements in the surfaces used for printing."—*This invention did not proceed to the Great Seal.*—It consists in employing a compound of india rubber and sulphur with or without other matters, and subjected to a high temperature "to obtain the change into hard material." For some purposes "a compound of india rubber, sulphur, and powder of lithographic stones or oxide of zinc subjected to a high temperature is used."

[Printed, 3d.]

A.D. 1855, July 23.—N° 1663.

GOODYEAR, CHARLES.—“Improvements in the manufacture “ of wheels for carriages and other vehicles when india rubber “ is used.” These are applying the hard compounds obtained by subjecting mixtures of india rubber and sulphur to high temperatures to the above purpose, and with or without metal.

[Printed, 3*l*.]

A.D. 1855, July 23.—N° 1664.

GOODYEAR, CHARLES (*a communication*).—“An improvement “ in manufacturing moulded articles made of compounds of “ india rubber.”—*This invention did not proceed to the Great Seal.*—It consists of “introducing water or fluid into the mould with “ the compound of india rubber, by which means, when the “ mould containing the compound of india rubber is subjected “ to heat to produce the change in the india-rubber compound, “ the water or fluid will be expanded into steam or vapour, which “ by its pressure will force the india-rubber compound into all “ parts of the mould, and cause it to fit the interior of the mould “ with great accuracy.”

[Printed, 3*l*.]

A.D. 1855, July 23.—N° 1665.

GOODYEAR, CHARLES.—“Improvements in bands or straps “ for confining or holding papers or documents and other articles “ where india rubber is used.”—*This invention did not proceed to the Great Seal.*—It consists “of making bands or straps for con- “ fining or holding papers or documents, or other articles, partly “ of vulcanized india rubber, where it is desired that the bands “ or straps should be elastic, the other parts of the bands or “ straps being composed of india rubber combined with fibrous “ material; or such other parts may be made of the hard com- “ pounds of india rubber.”

[Printed, 3*l*.]

A.D. 1855, July 23.—N° 1666.

GOODYEAR, CHARLES.—“Improvements in the manufacture “ of combs.”—*This invention did not proceed to the Great Seal.*—

574 INDIA RUBBER AND GUTTA PERCHA :

It consists in "introducing metal into the interior of such combs, " to give strength thereto or to parts thereof; for which purpose, " in moulding or forming the compounds of india rubber into " combs, metal combs or parts of metal are introduced or in- " closed by such compounds, by which the combs so made will " be stronger than when the compounds of india rubber alone are " used."

[Printed, 3d.]

A.D. 1855, July 23.—N° 1667.

GOODYEAR, CHARLES.—"Improvements in the manufacture " of boats and other vessels."—*This invention did not proceed to the Great Seal.*—It consists of "a mode of employing hard sub- " stances obtained by subjecting to high temperatures " com- " pounds consisting of india rubber and sulphur, with or without " other substances;" (such compounds "may be combined with " woven fabrics or with wire cloth, and be otherwise strengthened " with metal") as follows, by "combining and cementing together " sheets and parts" into "the desired form," and subjecting it to heat.

[Printed, 3d.]

A.D. 1855, July 24.—N° 1686.

GOODYEAR, CHARLES.—"Improvements in the manufacture " of carriages and other vehicles."—*This invention did not proceed to the Great Seal.*—It consists in making the bodies of the above by cementing the parts of the body together, which parts are made of sheets compounded of india rubber and sulphur with or without other materials, and subjecting the body so formed to heat.

[Printed, 3d.]

A.D. 1855, July 26.—N° 1696.

GEDGE, JOHN (*a communication from Paul Legreze and Auguste Andrien*).—"Improvements in pumps."—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time required by the Act.*—

It consists as follows:—"Making the body of the pump and both " the upper and lower boxes of one piece in cast iron. Above and " below these boxes are to be placed receivers or bottles, which " communicate with the suction and ascension pipes." " Air is " intercepted by valves or plates of caoutchouc, which are placed on " the body of the pump; these receive the cover or lid; the piston, " a brass rod, working with a cylinder of lead," is "made some- " what hollow at its outer periphery, which is surrounded with " caoutchouc, which not only clasps it, but impinges on or " against the interior casing or sides of the body of the pump."

[Printed, 3d.]

A.D. 1855, July 26.—N° 1703.

GOODYEAR, CHARLES (*a communication*).—"An improvement " in the manufacture of gunpowder."—*This invention did not proceed to the Great Seal.*—It consists "of applying india " rubber or gutta percha with sulphur and saltpetre in the manu- " facture of gunpowder."

[Printed, 3d.]

A.D. 1855, July 28.—N° 1725.

GOODYEAR, CHARLES.—"Improvements in manufacturing " covers for floors when compounds of india rubber are used."—*This invention did not proceed to the Great Seal.*—It consists in "making colored and ornamental sheets of india rubber combined " with sulphur, with or without other matters, and subjecting " such compounds to heat, in order to change the ornamented " sheets into hard compounds of india rubber."

[Printed, 3d.]

A.D. 1855, August 7.—N° 1784.

BEDELLS, CALEB.—"An improvement in the manufacture " of elastic fabrics." It consists in "cementing sheet vulcanized " india rubber in a distended state between two surfaces of fabric " woven in a warp and shuttle loom." For some purposes, " instead of cementing the sheet vulcanized india rubber between " two woven fabrics," it may be attached "to the surface of one

576 INDIA RUBBER AND GUTTA PERCHA :

" fabric only while in a distended state." India-rubber cement is employed.

[Printed, 3d.]

A.D. 1855, August 7.—N° 1787.

JOHNSON, JOHN HENRY (*a communication from Austin S. Day*).—“Improvements in the manufacture of india rubber.” The “caoutchouc or other raw gums” is first “cut or torn with any suitable machinery into small shreds or pieces, and is then well washed in water in the ordinary manner,” and “placed in an air-tight vessel.” “The air and noxious gases are exhausted from the caoutchouc or other gum by means of an air pump,” &c.; and “when a sufficient vacuum is produced in the air-tight vessel, a solution of caustic alkali, composed of caustic soda or potash, is admitted.” “When these gums have remained a sufficient time under the action of the caustic alkali, the solution is drawn off;” and the gum is removed from the air-tight vessel, and placed in a vat filled with water, where it is kept well stirred and agitated, in order to detach the particles of cut caoutchouc or other gum from each other.” As soon as this occurs, the greater specific gravity acquired by the foreign porous substances while subjected to the previous action of the caustic alkali causes them to sink to the bottom of the cistern, whilst the pure gum is left floating on the surface.”

[Printed, 7d.]

A.D. 1855, August 13.—N° 1833.

HANCOCK, WALTER.—“Improvements in the manufacture of casks or barrels, or of the linings of the same, and which improvements are also applicable to other hollow vessels.” These are said to be “manufacturing of casks or barrels and other hollow vessels, by the use of rotating blocks or rollers, in apparatus” which is described. “Instead of using two pieces of sheet gutta percha,” joined together as heretofore in the form of a truncated cone for lining casks, &c., employing “a revolving roller,” “of the size and shape of the cask, &c., working

" in a trough of cold water." " A sheet of gutta percha, or compound of gutta percha, is in a plastic state " wound upon the roller, and becomes set in passing into the water in the trough. This roller is supplanted by another roller, and the linings of the body, thus formed, are cut to the desired size, and end pieces affixed, &c.

[Printed, 7d.]

A.D. 1855, August 14.—N° 1842.

SHEARS, GEORGE. — " An improved construction of stereoscope." It consists in constructing these instruments so as to admit " of their being packed away in a shallow box when not in use." For this purpose, " in place of the rigid inclined body " which " supports the cross piece that carries the lenses," " make each of the sides of the instrument of two pieces, and connect these pieces together by a butt hinge, so that the sides may be folded up;" also "attach to the inner face of these pieces a vulcanized india-rubber spring, in such a manner that where the stereoscope is opened these springs will retain the parts in position, but will yield to pressure, and allow the parts to fold the one over the other when it is required to close the instrument," &c.

[Printed, 7d.]

A.D. 1855, August 16.—N° 1860.

PAGET, FREDERICK (*a communication*).—" An improved holder for steel or other pens, by which ink is supplied to them." — *This invention did not proceed to the Great Seal.*—It consists " in constructing the upper part or handle of the penholder of vulcanized india rubber, gutta percha, or other elastic or yielding material in combination with wood or other rigid material, if necessary, to give it support." " This holder or handle is hollow, with a piece of sponge, &c. forming a reservoir for ink. The supply of ink to the pen is regulated by the pressure applied to the exterior of the holder by the fingers at the time of writing."

[Printed, 3d.]

A.D. 1855, August 16.—N° 1861.

ROWLEY, CHARLES.—“Improvements in elastic bands.”—These are, “the making of elastic bands by cutting india rubber into strips or strands, and dividing such strips or strands into suitable lengths, and uniting them together at the ends,” by which are avoided the “making of any scrap or waste ; also, the use of expensive tools, and at the same time to greatly increase the general utility of the article.”

[Printed, 7d.]

A.D. 1855, August 27.—N° 1937.

SAUTELET, EMILE CONSTANTIN FRIT.—“An improved impermeable cloth or fabric for sheltering, covering, and preserving in various purposes.” In consists in manufacturing an impermeable cloth or fabric by the combination of loose or unwoven wool or hair,” “from tanneries and similar places,” with caoutchouc, or gutta percha, or other similar elastic or flexible gum.” The caoutchouc is soaked with an ordinary solvent, and made into a paste which is spread upon the wool or hair. Other substances, such as lime, zinc white, white lead, sulphur, or colors may be added.

[Printed, 3d.]

A.D. 1855, August 30.—N° 1960.

STANSBURY, CHARLES FREDERICK (*a communication from M. H. Merrian and Joseph B. Crosby*).—“A machine for splitting leather and for analagous purposes.”—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists, first, “of a disc cutter, having a simultaneous rotary and reciprocating movement relative to the machine in a plane at right angles to the axis of rotation ;” second, “of an endless apron passing over an elevated bed and roller, combined with another roller having a greater speed than that of the apron” for feeding the leather, india rubber, &c. to the above cutter ; third, obtaining an increased feed or draft by having one



of the surface rollers with "a greater surface speed in some portions of it than others."

[Printed, 3*d.*]

A.D. 1855, September 1.—N<sup>o</sup> 1971.

BUTCHER, MATTHEW and NEWHEY, THOMAS HENRY.—  
"An improvement or improvements in the manufacture of bobbins used in winding, twisting, and weaving fibrous substances." This consists in "manufacturing bobbins used in winding, twisting, and weaving fibrous substances of gutta percha, hardened by the introduction of grit or sharp sand, aluminous earth, or other solid capable of hardening the same."

[Printed, 5*d.*]

A.D. 1855, September 1.—N<sup>o</sup> 1974.

JOB, ALFRED MORTIMER, and TOMLINSON, EDWARD.—  
"A new article to be called 'india rubber leather cloth,' applicable to covering roofs, floors, trunks, and for other similar purposes."—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists "in combining particles of leather" with "india rubber or gutta percha, or with both." Also mixing "metal dust or filings" with the same. Printing upon sheets, &c. of the compound, and applying it "to the covering of knife boards for setting in pins or wire teeth, for making of cards, for covering of drums of carding machines, for covering of floors, stairs, trunks, roofs, buttons," &c.

[Printed, 3*d.*]

A.D. 1855, September 4.—N<sup>o</sup> 1995.

CLARK, CYRUS, and CLARK, JAMES.—"An improvement in the manufacture of boots and shoes." This consists in "combining a golosh or overshoe of india rubber, gutta percha, or other material with a boot or shoe manufactured in the ordinary manner, or manufactured in such manner as to form a fixed lining to the golosh or overshoe of india rubber."

[Printed, 3*d.*]

A.D. 1855, September 8.—N° 2039.

BALESTRINI, PIER ALBERTO.—“Improvements in insulating “wires for electric telegraphs.”—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists as follows:—Winding the wires with hemp,” &c., next applying “several coatings of india rubber solution,” afterwards coating “with marine glue.” Strands of hemp, &c. are wound upon this in an opposite direction to the previous winding,” and coatings of india-rubber solution and marine glue are applied, after which it is coated with a cord, &c. made waterproof by india-rubber solution, &c.; “but when several wires are to be used and “greater strength is required, then a metallic wire is wound “around the bunch or bundle of the above insulated wires.”

[Printed, 3*d.*]

A.D. 1855, September 8.—N° 2040.

DURANT, ANGUISH HONOUR AUGUSTUS.—“Improvements in “apparatus for sweeping and cleaning chimnies.” These improvements contemplate simplifying the apparatus employed, and rendering it lighter and more durable; and the “invention consists” partly “in applying vulcanized india rubber and gutta “percha in forming the flexible connections and elastic parts of “such apparatus,” &c.

[Printed, 7*d.*]

A.D. 1855, September 14.—N° 2074.

CHURCH, WILLIAM.—“Improvements in mounting and “adjusting ordnance and other fire-arms.” These are several; “one of which is, “connecting gun carriages with the traversing “platform upon which they work by means of straps or bands of “vulcanized caoutchouc, so as to counteract the recoil of the gun “and restore it to its place after its discharge.” These bands “are attached at one end to the interior portion of the platform “by means of a rod,” and “at their other end to the bottom of “the gun carriage.”

[Printed, 10*d.*]

A.D. 1855, September 15.—N° 2090.

FORD, ALFRED.—“Improvements in preparing solutions of “caoutchouc, gutta percha, and like gums for waterproofing and “like purposes.” These are said to be, first, “the process for “purifying oil of turpentine and naphtha.”

Second, applying “solutions and compounds” “prepared as “described” for waterproofing and otherwise. The oil of turpentine or naphtha is agitated with a caustic alkali or alkaline earth, separately or combined, for some days, and the whole allowed to subside. The supernatant fluid is drawn off, and may be passed through charcoal, &c. The solvent thus purified “readily” dissolves “india rubber, vulcanized india rubber, gutta “percha, or any mixtures of the same,” “first reduced to shreds.” Vulcanized india rubber is steeped in these solvents for some time, and bruised or torn up and heated; the excess of solvent may be condensed. Solutions so prepared may be mixed with oxides, &c. and coloring matters, and with oxides or salts of copper, singly or otherwise, “as a coating for iron ships’ bottoms.”

[Printed, 3d.]

A.D. 1855, September 17.—N° 2093.

SCOTT, URIAH.—“Certain improvements in the construction “of vehicles, and the various parts of the same.”—*This invention did not proceed to the Great Seal.*—It consists in a means to reduce the amount of wear and tear, and lessen the vibration, noise, &c. in vehicles by the interposition of india rubber alone or with other substances in layers, blocks, or bands at different parts of the vehicle, the shape, &c. depending upon the object to be effected and the place it is to be applied.

[Printed, 3d.]

A.D. 1855, September 29.—N° 2170.

BARLOW, HENRY BERNOULLI (*a communication*).—“Improvements in mills and other machines of the like nature for spinning “and doubling cotton, and other fibrous substances.” These improvements are said to be thirteen in number, and one is, the applying “a spring of vulcanized india rubber for rewinding the

582 INDIA RUBBER AND GUTTA PERCHA :

"winding-on chain on the barrel in the carriage of the mule."  
The spring "keeps the chains at the proper tension."

[Printed, 2s.]

A.D. 1855, October 5.—N° 2225.

GRAHAME, THOMAS.—"Improvements in the construction of  
"floating batteries or vessels in order to render them ball and  
"shot proof. — *This invention received provisional protection,  
but notice to proceed with the application for Letters Patent was not  
given within the time prescribed by the Act.*—It consists in making  
the above of iron, covering them with a considerable thickness of  
cork, and again placing over the cork a thin sheet of iron, and  
covering the whole with sheet india rubber, by preference vul-  
canized, "which by its elasticity will close up in the event of a  
"ball or shot passing through it," and thus "prevent the water  
"following the ball," &c.

[Printed, 3d.]

A.D. 1855, October 5.—N° 2232.

LEPAGE, FRANÇOIS CHARLES.—"A new composition or new  
"compositions of materials, which may be employed as a substi-  
"tute for wood, leather, gutta percha, bone, metal, and other  
"hard or plastic substances, and the method of manufacturing  
"the same." First, soak sawdust in albumen "liquified by water  
"or otherwise," dry it well, and subject it to hydraulic pressure,  
place it in a mould of the shape required, and submit it to heat  
and pressure at the same time. "Coloring or other substances  
"may, if desired, be added to the sawdust."

[Printed, 6d.]

A.D. 1855, October 8.—N° 2242.

HUBBARD, JOHN.—"An improved sole for boots or shoes."  
Making the sole of "gutta percha, or any compound thereof,"  
combined with leather, "so as to form a solid and waterproof sole,  
"with leather rim or margin, capable of being readily stitched or  
"attached to the uppers." This is effected as follows:—"Pare off  
"and bevil the inner surface of the leather from the inner edge of the

“ rim ;” cut a piece of gutta percha exactly “ to fit within the bevilled edges of the leather rim,” and place a thin piece of leather “ or woven fabric upon the inner surface of the sole ;” this, together with the bevilled edges, is covered with a solution of gutta percha, and the whole is submitted to “ heat and pressure in a mould.”

[Printed, 3*d*.]

A.D. 1855, October 13.—N° 2288.

COCKINGS, JAMES SEPTIMUS, and POTTS, FERDINAND.—“ Certain improvements in sockets for holding whips and candles ; parts of which are also applicable to the sockets or irons for holding carriage and other lamps.” These improvements are said to be twelve in number. Of these, one is, “ the forming and applying gutta-percha linings to whip sockets in such manner as to allow the gutta percha to project down around the edge of the body of the socket, whereby the lining, without the necessity of sewing, is prevented from contracting or wearing loose, as also the impressing of any ornamental design around such socket linings.” Another, “ the application to whip sockets of india-rubber caps or mouthpieces, such caps or mouthpieces being moulded, in contradistinction to their being made from sheet rubber, whereby they may be made in an ornamental shape, as also with a projecting rim to clip over and around the top of the socket.” Also, the mode “ of making and applying gutta percha linings and rims to whip sockets, without regard to the precise shape of the gutta percha linings or rims, or to the moulds by which they are formed.” The lining is held by the rim of the socket being pressed over upon it.

[Printed, 11*d*.]

A.D. 1855, October 18.—N° 2336.

STATHAM, SAMUEL.—“ Improvements in electric telegraph cables.” It consists as follows :—“ Take a core of gutta percha or other insulating material, containing therein one or more metallic wires, strips, or plates, used for conducting the electric fluid, and place thereon, or round or over such core, strands of hemp or cord, or a tube of any suitable fibrous material, or metallic wires or strands covered with fibrous material, or both

584 INDIA RUBBER AND GUTTA PERCHA :

“ wires or strands and fibrous material, or with wire or strands of  
“ wire, fibrous material and wire, or strands covered with fibrous  
“ material, either or all of these substances being coated with  
“ some protecting material, such as marine glue, or employed  
“ without being coated; and “ encase the core covered by one or  
“ other or all of the materials just named in an outer casing  
“ or tube of gutta percha, or any of its known compounds,  
“ or either of these combined with metallic or other substances.”

[Printed, 3*d*.]

A.D. 1855, October 22.—N° 2359.

PARKES, ALEXANDER.—“ Certain preparations of oils for, and  
“ solutions used when waterproofing, and for the manufacture of  
“ various articles by the use of such compounds.” Adding to  
oils, such as linseed, rape, &c., chloride of sulphur, the effect  
of which “ is to render them insoluble in naptha, sulphuret of  
“ carbon,” their usual solvents.

Oils, so changed, have the character of vulcanized india rubber.

Combining india rubber or gutta percha with the oils, and  
adding chloride of sulphur.

Using a “ solution of gum cotton (collodion) alone, or with  
“ gums or resins that will set transparent with it or with colour.”

These compounds are applied to waterproofing, &c., &c., and  
the purposes to which india rubber alone is employed.

“ Gun cotton substances are rendered less inflammable ” by  
adding substances such as “ phosphate of ammonia and mag-  
“ nesia, iodide of cadmium, periodide of mercury, oxalate of lime,  
“ talc, alum.”

[Printed, 4*d*.]

A.D. 1855, October 24.—N° 2375.

SMITH, JAMES.—Improvements in apparatus for giving alarm  
“ signals, and for extinguishing fires.” These are, in the  
“ modes of obtaining self-acting alarms and self-acting water  
“ supply in cases of fire.” First, applying “ gutta-percha lines  
“ or cords passed through the chambers,” &c., to be protected,  
“ which being weighted at one end, and connected by a catch to  
“ a suitable alarum, the same will be put in action by the melting

AIR, FIRE, AND WATER PROOFING. 585

“ or burning of the gutta percha.” Second, “ pipes wholly or partly of gutta percha, through which water may be conveyed from any convenient reservoir by turning a stopcock, effected by the falling of a weight caused by the breaking of the gutta-percha cord or line,” &c.

[Printed, 3d.]

A.D. 1855, October 27.—N° 2405.

**TOMLINSON, EDWIN, and JOB, ALFRED MORTIMER.**—“ Improvements in waterproofing skins of animals.—*This invention is void by reason of the patentee having neglected to file a specification in pursuance of the conditions of the Letters Patent.*—It consists as follows :—The skins, first dressed, are placed in a close heated chamber, “ in order to draw the greasy ” matters they contain to the surface. Trays of sulphur and quicklime are placed in the bottom of the chamber, so that their “ fumes ” or “ vapour ” may rise and become “ absorbents ” of the greasy matters ; or these “ absorbents, in a dry or solvent state,” are applied to the surface. “ When the skins have been freed from “ the oily or greasy matters they contained ” they are coated with india rubber, &c.

[Printed, 3d.]

A.D. 1855, November 1.—N° 2437.

**MILNER, GEORGE.**—“ Certain improvements in the manufacture of bedstead bottoms, part of which improvements are “ applicable to various other purposes for commercial and domestic use.” These are, applying “ flexible or elastic bands interlaced in the continuous manner of trellis or lattice work, “ separately, or connected with links of india rubber, to bedsteads “ and other frames and fixtures, for the purposes of repose and “ rest,” “ by passing the ends of the band through a number of “ eyes systematically arranged on the frames, and the two ends of “ the band made fast in a double-mouthed buckle.”

[Printed, 10d.]

A.D. 1855, November 1.—N° 2446.

**TRUMAN, EDWIN THOMAS.**—“ Improvements in palates or “ holders for artificial teeth.” These are, first, “ the making

586 INDIA RUBBER AND GUTTA PERCHA:

" of the palate plates or holders for artificial teeth of aluminum," " the fitting of artificial teeth with loops or eyes," and " the fixing of the whole together by gutta percha alone, or by pins or wires and gutta percha." Second, " the combined employment, in the manufacture of palates or holders for artificial teeth, of aluminum and gutta percha, together with platinum, or other suitable metal loops, eyes, or wires."

[Printed, 3d.]

A.D. 1855, November 7.—N° 2499.

HALEY, JOSEPH.—" Improvements in the buffers and spring draw bars of waggons and other railway vehicles, and in the application of the same." These consist " in connecting together, by means of a cross plank, the two buffers at the same end of the carriage, having their separate and distinct springs" of india rubber or any elastic substance.

[Printed, 1s. 2d.]

A.D. 1855, November 12.—N° 2547.

JOHNSON, JOHN HENRY (*a communication from Henri Victor Wacrenier*).—" Improvements in the manufacture or preparation of hard india rubber, and in the application thereof to the construction of parts of textile and other machinery."—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists in manufacturing hard india rubber, " mixing with the india rubber and sulphur the shells or scales of oysters," &c., in powder, and applying this compound to the manufacture of " bobbins, cylinders, and rollers, and coupling or clutch boxes," " plate bolsters," " bearings for driving or other shafts."

[Printed, 3d.]

A.D. 1855, November 12.—N° 2548.

THORNTON, WILLIAM CARR, and THORNTON, BENJAMIN.—" Improvements in machinery or apparatus for preparing and spinning wool, which improvements are also applicable to washing and wringing machines for the same material."—*This invention received provisional protection, but notice to proceed with the appli-*



*cation for Letters Patent was not given within the time prescribed by the Act.*—It consists “in covering the rollers used for drawing “or conveying wool in preparing and spinning machinery with “‘vulcanized’ india rubber;” also “covering of rollers used in “washing and wringing machines for wool.”

[Printed, 3d.]

A.D. 1855, November 14.—N° 2567.

GOODYEAR, CHARLES.—“Improvements in shoes and boots “when india rubber is used.” These consist of “making “‘uppers,’ or parts of the ‘uppers,’ when india rubber is used, “with corrugations, such corrugations being perforated with “numerous small holes to admit of the passage of air, and thus to “ventilate the upper parts of the feet.”

[Printed, 5d.]

A.D. 1855, November 22.—N° 2630.

TOLHAUSEN, ALEXANDRE (*a communication from Horace P. Herdman*).—“Certain improvements in bombs and other explosive projectiles whose charges are to be fired by percussion.” One of these improvements is, “filling the empty space between “the interior of the neck by a caoutchouc collar, which seals “hermetically the shell against the entrance of water or dampness, which collar serves at the same time as a spring to prevent the hammer striking the priming, except at such time as “the projectile touches the ground or any other body, and by its “weight and momentum produces the explosion.”

[Printed, 6d.]

A.D. 1855, November 22.—N° 2634.

HIBLING, HENRY.—“Improvements in waterproof boots and “shoes.”—*This invention did not proceed to the Great Seal.*—It consists in “making that part of boots and shoes called the “‘galoshe’ of a fabric of cloth coated with india rubber, and so “made impervious to wet, or of thin sheet india rubber, and of “cementing this waterproof ‘galoshe’ to the upper part of the “boot or shoe, and also of cementing the sole thereto by a cement

588 INDIA RUBBER AND GUTTA PERCHA :

“ or solution made of dissolved india rubber, thus rendering the whole waterproof.”

[Printed, 3*d*.]

A.D. 1855, November 23.—N° 2646.

LISTER, SAMUEL CUNLIFFE, and Warburton, James.—“ Improvements in spinning.” In these improvements relating to spinning, one is, “ the use of gutta-percha drawing rollers when spinning cotton in a wet state,” “ instead of covering the rollers with leather, as is now practised.”

[Printed, 7*d*.]

A.D. 1855, November 26.—N° 2656.

JONQUET, DENIS.—“ Improvements in the blades of mechanical cutting machines, and in the blades of single or double-handled cutting instruments, and in the blades of ordinary and mechanical shears and scissors, and in the handles and springs for the same.” In these improvements, of which there are several, one is said to be in “ affixing india-rubber springs inside or outside of the shears or scissors.” These springs are in the form of a narrow band, and are attached to each of the blades of the instrument in such a manner as to pull them open on withdrawing the pressure from their handles.

[Printed, 10*d*.]

A.D. 1855, November 27.—N° 2671.

RICE, CHARLES.—“ A new or improved method of manufacturing boots or shoes.” This consists “ in uniting the outer sole and upper, manufactured wholly or in part of india rubber, with the insole of boots and shoes, by means of cement, the cement passing through perforations made for that purpose in the upper.” The cement is india rubber or some such analogous cement; “ and after the upper is lasted, the holes or perforations are filled up with it by pressure,” &c.

[Printed, 8*d*.]

A.D. 1855, November 27.—N° 2679.

JOHNSON, JOHN HENRY (*a communication from Henri Victor Wacrenier*).—Improvements in the manufacture or preparation of

" india rubber and gutta percha, and in the applications thereof." These are, "mixing with gutta percha or india rubber" calcined shells or other cheap substance of a like nature reduced to powder;" constructing of hard india-rubber or gutta-percha "rollers and cylinders and coupling or clutch boxes of spinning machines," "plate bolsters, footsteps, collars, and bearings for the spindles of spinning machines," the "bearings of driving and other shafts," the "back spindles of doubling and twisting machines," "bobbins, reels, and spools used in spinning machines;" also, constructing racks, ratchets, and gearing of hand and power looms and spinning frames of hard india rubber.

[Printed, 4*d*.]

A.D. 1855, November 28.—N° 2634.

RICHARDSON, GEORGE (*a communication*).—"Improvements in buffer, draw, and bearing springs for railway carriages and waggons." These are, applying and using "springs composed of india rubber or other elastic gums in the form of cylinders having a greater diameter at the two ends than in the middle." "These are contained in suitable sliding boxes or cases."

[Printed, 6*d*.]

A.D. 1855, December 5.—N° 2740.

NEWTON, ALFRED VINCENT (*a communication from Mr. Nos d'Argence*).—"Improvements in apparatus for dressing cloth." These are, first, the "application of metallic teazles," constructed as described, "to machines for dressing woollen cloth." The backs are made "of fillets of vulcanized india rubber," "strengthened with any suitable woven fabric;" and in these fillets insert teeth "made of iron or steel, more or less fine, according to the work to be done," &c. Second, "the use of teasing surfaces" (as above) arranged so as to operate "both longitudinally and transversely," as described.

[Printed, 7*d*.]

A.D. 1855, December 6.—N° 2742.

HAWKER, CHARLES, and HAWKER, THOMAS PARRY.—"An improved method of manufacturing cartridges."—*This invention is*

590 INDIA RUBBER AND GUTTA PERCHA:

*void by reason of the patentees having neglected to file a specification in pursuance of the conditions of the Letters Patent.*—It consists in producing a waterproof cartridge. A cylindrical case of gutta percha is made with a cavity at one end for the bullet. The charge of powder is put into the case, and it is secured by cementing it at the end by heat and pressure; the bullet is put into its own cavity, and secured by an “outer case of book muslin,” &c.

[Printed, 3d.]

A.D. 1855, December 7.—N<sup>o</sup> 2759.

LATTA, ANTOINE.—“Preparing gutta percha in combination “with other substances applicable to various purposes.”—*This invention received Provisional Protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists “in mixing gutta percha with “other substances, and obtaining useful products.” The mixtures are made of gutta percha, flour of brimstone, coal, gum lac, cotton, and they are vulcanized.

[Printed, 3d.]

A.D. 1855, December 10.—N<sup>o</sup> 2788.

JENNINGS, JOSIAH GEORGE.—“Improvements in connecting “earthenware rain pipes and soil pipes of waterclosets, and in “valve waterclosets.” These are as follows:—“Each socket or “junction is cast with an internal rib or projection of the thick- “ness of the earthenware pipes which are to be fixed into it, and “on the outside there is a lug or lugs to fix the junction or “socket to a wall or part of a building.” “The junction or “socket is fixed to the end of an earthenware pipe in the follow- “ing manner:—There is a groove around and near the end of “the pipe, so that when the end is introduced into the socket, “and melted asphalte or cement is run into the socket between it “and the pipe, there will be a good joint formed. In fixing the “end of another pipe into the socket, a flexible washer or ring of “vulcanized india rubber is placed on the projection in the “socket, and the whole of the surfaces are coated with red lead “or suitable cement, and then the end of the other earthenware

" pipe s introduced, and a sound joint is made." And in making the " surfaces of valve waterclosets, in order to ensure " waterproof contact at all times when the valves are shut, a ring " or surface of vulcanized india rubber is applied to the seat of " each valve, and in addition thereto a ring or surface of vulcan- " ized india rubber is applied to the valve itself, in such manner " that, when the valve is shut, the two rings or surfaces of " vulcanized india rubber come together and form a good joint."

[Printed, 9d.]

A.D. 1855, December 11.—N° 2793.

PRÉAUD, JEAN MARIE.—" Certain improvements in india- " rubber springs." These are springs or blocks " of either " genuine india rubber, or the same blended with other sub- " stances, vulcanized or not, solid or hollow, with no angles, or " no other but round or roundish forms, applicable to railway " and other vehicles, and also to any apparatus requiring the " application of a spring."

[Printed, 6d.]

A.D. 1855, December 20.—N° 2880.

PORTEOUS, DUNDAS SMITH.—" Regulating the pressure of " gas, steam, water, or other fluids," as follows:—A box is partially filled with water, and has another box oscillating from its centre inverted in it, dipping into the water, and thus forming an air-tight joint. The entrance pipe for the gas is above the water, and has a valve opening inwards, attached to which is a short link connecting the valve with the top of the inner box or cover. The discharge pipe passes down through the water, and out at the other side of the box. A pin is on the top of the inner box, for weights to depress it and open the valve; and " when the gas is wanted of a pressure less than the weight " of the cover " a lever from the end of the box where it oscillates is weighted.

Several arrangements, somewhat resembling the above, are described; and, instead of a cover with a water joint, the cover is made of any flexible material capable of withstanding the pressure and action of the gas, but vulcanized india rubber is preferred, &c., &c.

[Printed, 9d.]

A.D. 1855, December 27.—N° 2928.

KRUPP, ALFRED.—“ Certain improvements in guns and gun carriages.” In these improvements, one is said to be, “ the adaptation to the carriages of guns and ordnance vulcanized india rubber, or other suitable elastic or metal springs, for the purpose of resisting or lessening the recoil of such guns or ordnance when discharged ; and also the methods for adapting to the carriages of guns and ordnance these springs. These springs are “ placed behind (the trunions), and may be placed in front, or in any other convenient position, and connected by suitable means to the trunions of the gun, or the bearings in which the trunions rest.”

[Printed, 10*d*.]

A.D. 1855, December 29.—N° 2944.

FORD, ALFRED.—“ Preparing and dissolving in naphtha, or oil of turpentine, vulcanized india rubber for the purposes of waterproofing, and all or any of the other purposes for which the same, not so prepared and dissolved, is now applicable.—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—Vulcanized india rubber is cut into pieces and placed in a boiler, and subjected to heat under pressure, until, by the action of the gas within, it is sufficiently softened, when it is taken out, and “ worked up with French chalk, sulphur, charcoal, lamp-black, black-lead, or some other metallic oxide.”

[Printed, 3*d*.]

1856.

A.D. 1856, January 1.—N° 5.

JOHNSON, WILLIAM BECKETT.—“Improvements in steam “boilers and engines.” In this invention the improvements in boilers relate to the flues, &c., and in engines to “apparatus for “working expansion valves;” in which last an improvement is stated to be, adapting “to the rod by which motion is communicated to the expansion valve,” “vulcanized india rubber, or “other such material, in order to gain an elasticity therein.”

[Printed, 10d.]

A.D. 1856, January 15.—N° 109.

SHEPPARD, SAMUEL.—“A new or improved tap or stopcock.” It consists as follows:—“First, constructing taps or stopcocks,” with a “detached spherical valve of vulcanized caoutchouc or “other elastic material; the said elastic valve being forced “against the pressure of the liquid upon its bed or seat, or liberated therefrom by means of a plunger raised and lowered by a “screw.” Second, “preventing leakage at the axis of taps or “stopcocks” “by washers or packings, tightened by means of a “nut screwing on the axis of the tap or stopcock.”

[Printed, 5d.]

A.D. 1856, January 16.—N° 115.

SCULLY, VINCENT, and HEYWOOD, BENNETT JOHNS.—“Improvements in the construction of inkstands, applicable in part “to other vessels for the reception of fluids.” These are, fitting “in an opening of the cover of an air-tight inkstand a double or “flexible valve,” by preference made “of two discs or dish-shaped “pieces of vulcanized india rubber, the upper one being pierced “to allow air to pass upwards through it when air is required to “be withdrawn from the inkstand, and the lower one being made “self-closing, so as, when pressed upon, to serve as an ingress, “egress, or cut-off valve, as required.” By the action of this “compound valve, air is forced in or withdrawn from the ink-

594 INDIA RUBBER AND GUTTA PERCHA :

“ stand, and, simultaneously, the rise of the ink to, or its descent from, the dipping cup is effected.” Also, applying valves, acting on the self-closing principle, to certain other uses, the arrangement of the valves in each example being specially adapted to the purpose for which it is applied. These valves are formed “ of discs of thin sheet vulcanized rubber,” slit across, and they are generally secured on the ends of a flexible tubular chamber ; these are applied “ to syringes, infants’ feeding bottles, beer barrels, “ and other vessels for the reception of fluids.”

[Printed, 7d.]

A.D. 1856, January 18.—N° 140.

MYERS, EDWARD.—“ Improvements in buffers and other springs for railway and other carriages.”—*This invention did not proceed to the Great Seal.*—It consists in “ fitting two or more series of “ annular vulcanized caoutchouc springs, in a suitable spring box “ or casing, each set of springs being placed in a separate and “ distinct compartment of its own, such compartments being centrally arranged, so that the inner set of springs will be of “ smaller diameter than the outer ones.” “ The inner end of the “ buffer rod, or other portion receiving the shocks, has a number “ of circular projections formed on it, or fitted thereto, such projections corresponding to and fitting into the chambers containing the different sets of springs.” “ The springs in each set “ are arranged in gradually increasing or decreasing numbers, so “ that the buffer, if applied thereto, will first be brought in contact only with one set of springs, and then with a second set, “ and so on, thus meeting with greater resistance the further it is “ pushed inwards, by which means the shocks of the buffers will “ be more gradually deadened than by existing arrangements.”

[Printed, 3d.]

A.D. 1856, January 18.—N° 141.

DODGE, NATHANIEL SHATTSWELL (*a communication*).—“ Improvements in treating vulcanized india rubber or gutta percha.” These are, reducing these substances “ to a soft, plastic, or liquid “ state by means of alcohol and bisulphuret of carbon,” to allow them to be re-manufactured. The refuse material is reduced to small pieces and treated in a close vessel for two hours with a



AIR, FIRE, AND WATER PROOFING. 595

mixture of absolute alcohol and bisulphuret of carbon, " in the  
" proportion of a quarter of a pound weight of the former to ten  
" pounds weight of the latter, to one hundred pounds weight of  
" the material."

[Printed, 3d.]

A.D. 1856, January 23.—N° 178.

JOHNSON, WILLIAM (*a communication*).—" Improvements in  
" the treatment and application of fatty, resinous, and gummy  
" substances, and in the manufacture of pastes, greases, and  
" soaps."—*This invention is void by reason of the Patentee having  
neglected to file a Specification in pursuance of the conditions of the  
Letters Patent.*—It consists in combining " gluten, starch, or  
" flour, or the farinaceous, slimy, or gummy matters of vegetables,  
" with resins, fats, soaps, greases, oils, wax, pitch, and bituminous  
" substances, for the advantageous application of the compounds  
" so obtained to various useful purposes; and, for example, in the  
" manufacture of soaps, greases, and pastes, and of compounds  
" containing gutta percha or caoutchouc," &c.

[Printed, 3d.]

A.D. 1856, January 25.—N° 199.

COLLINS, WILLIAM WHITAKER.—" An elastic junction, appli-  
" cable to carriages and other purposes.—*This invention did not  
proceed, the Law Officers having refused provisional protection.*—  
It consists as follows :—" Fix thin layers of unvulcanized indian  
" rubber to the metal plates," afterwards unite them to a thicker  
piece, and then vulcanize the whole.

[Printed, 5d.]

A.D. 1856, January 26.—N° 216.

STATHAM, SAMUEL.—" Improvements in electric telegraph  
" conductors." These consist " in forming a metal conductor  
" which will extend or stretch, not only in the manner and to the  
" extent of an ordinary wire or strand, but whose greater exten-  
" sion is due to the manner in which it is constructed." The  
conductor is a hollow strand, formed by wires laid spirally, or by a  
braiding machine, &c.; or it may be " a plaited or braided band

596 INDIA RUBBER AND GUTTA PERCHA

“made up loosely of metal wires, and threads of india rubber, gutta percha, or their compounds.”

[Printed, 3d.]

A.D. 1856, February 1.—N° 281.

BESTWICK, HENRY, and BURY, JOSEPH.—“Certain improvements in cocks, taps, or valves.” These consist “in constructing a self-closing tap, by arranging or placing an india-rubber or other spring in the cap or top of the cock, tap, or valve, so that it shall press against the spindle, to which the valve is secured, in such a manner as to keep the valve always closed, and also against the stud or button, which receives pressure from without when the valve is required to be opened.”

[Printed, 5d.]

A.D. 1856, February 1.—N° 282.

HOOPER, GEORGE NORGATE, and HOOPER, WILLIAM.—“Improvements in springs for carriages, and for the cushions of carriages, chairs, mattresses, beds, and other similar articles.” These are, first, “the general constructions, arrangements, and combinations of compensating springs for carriages, cushions, chairs, mattresses, beds, and other similar purposes.” Second, “the application of compensating springs, composed of rings or strips of vulcanized india-rubber, of different sizes or lengths, to the ordinary steel springs of vehicles.” Third, “the application of compensating springs, composed of rings or strips of vulcanized india-rubber, of different sizes or lengths, to the seats of carriages or chairs, and to mattresses, beds, and other similar articles of furniture.”

[Printed 9d.]

A.D. 1856, February 1.—N° 285.

DANNEQUIN, AUGUSTE EUGÈNE.—“Certain improvements in caoutchouc, or any other waterproof garments.”—*This invention did not proceed to the Great Seal.*—It consists as follows:—“Making a series of holes in the fabric to allow of the free passage

“ of the heated air or perspiration from the under garment,” and covering these rows of holes “by flaps of the waterproof material, “ or concealed by rows of buttons, or other similar means, by “ which the holes may be covered without impeding the ventilation “ of the garment.”

[Printed, 3d.]

A.D. 1856, February 4.—N° 305.

TURNER, WILLIAM ALLEN.—“ An improved preparation or “ mixture to be used in the manufacture of compounds of india “ rubber or caoutchouc.”—*This invention did not proceed to the Great Seal.*—It relates “to the manufacture of compounds of “ india rubber, known and distinguished as vulcanized india “ rubber.” Take “genuine bismuth, ordinary lead, virgin tin, “ and sulphur, in about the following proportions, namely, of “ genuine bismuth, 5 parts, ordinary lead, 3 parts; these are “ melted separately and mixed together with half their weight of “ sulphur.” In using the above mixture, mix 10 pounds of the “ same with 30 pounds of india rubber or caoutchouc.”

[Printed, 3d.]

A.D. 1856, February 11.—N° 353.

ZAHN, WILLIAM HENRY, and WELLS, JOSEPH HENRY GEORGE.—“ Improvements in windmills or wind engines.” These are, “the application of vulcanized india rubber or other springs, “ in combination with the machinery, for the purpose of making “ windmills or wind engines self regulating by allowing the “ increased velocity of the wind to act upon and lessen the surface “ of the sails, as well as for altering the surface or angle of the “ sails at will.”

[Printed, 7d.]

A.D. 1856, February 13.—N° 371.

NEWTON, ALFRED VINCENT (*a communication*).—“ Improve- “ ments in springs applicable to railroad carriages, and to other “ uses.” These are, “making volute springs (which are wound “ or coiled up with the coils close to sustain each other, as the “ force is applied in a direction parallel with the axis) of bars of

598 INDIA RUBBER AND GUTTA PERCHA :

" steel, tapering in width from the outer to the inner coil, when  
 " the said springs are so coiled that the upper edge of all the  
 " coils is on the same plane, and the lower edge of the several  
 " coils is in the line of a spiral," and also " combining with such  
 " a coiled spring a conical frustrum of vulcanized india rubber or  
 " caoutchouc placed within the conical cavity formed by the  
 " spiral line of the lower edge of the coils," " that the inner coils  
 " may be made sufficiently sensitive to yield to slight forces and  
 " be aided in resisting great forces by the gradually increasing  
 " tensive force of the india rubber as it is compressed by the  
 " successive coils coming in contact with it."

[Printed, 6d.]

A.D. 1856, February 18.—N° 406.

THOMSON, JAMES STRANG, and BARCLAY, ANDREW.—" Im-  
 " provements in printing and embossing textile fabrics and other  
 " surfaces, and in the production of apparatus to be employed  
 " therein." In these improvements, of which there are several,  
 " one is said to be " the system or mode of preparing matrices or  
 " moulds for forming printing surfaces in gutta percha, or other  
 " suitable material, by means of a built-up mass of pins or types,  
 " wherein two lengths of types are used, and also pieces corre-  
 " sponding to two or more single types, such types being built  
 " up, composed, or arranged according to the pattern to be  
 " produced."

[Printed, 1s.]

A.D. 1856, February 21.—N° 449.

CHATWIN, THOMAS TURNER, and CHATWIN, JOHN FRE-  
 DERICK.—" Improvements in buttons."—*This invention received  
 provisional protection, but notice to proceed with the application for  
 Letters Patent was not given within the time prescribed by the Act.*  
 —Of these improvements, of which there are several, one is said  
 to be, " using an elastic material, such as vulcanized caoutchouc,  
 " in the interior of buttons," as follows:—" The central part of  
 " the metal disc or shell constituting the face of the button is cut  
 " away, and the elastic material is made to protrude through the  
 " shell;" " the whole is covered with the outer fabric of the  
 " button."

[Printed, 3d.]

A.D. 1856, February 27.—N° 500.

JOHNSON, JOHN HENRY (*a communication from Charles Vincent Steinlen*).—"Improvements in the treatment of hard india rubber for the purpose of rendering the same applicable to the manufacture of pens, tubes, springs, and other similar articles."—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—The vulcanized sheets are cut into strips; these strips are softened by exposure to heat, and passed between heated polished steel, or iron rollers again heated, &c.

[Printed, 3d.]

A.D. 1856, February 27.—N° 502.

EXALL, WILLIAM.—"Improvements in the manufacture and arrangement of sawing machinery." These are several, one of which is said to be, "lining the riggers or cylinders over which the saws run with gutta percha, india rubber, or other similar waterproof substance to resist moisture, particularly in cutting stone or in out-door work."

[Printed, 10d.]

A.D. 1856, February 27.—N° 504.

INGLIS, ALEXANDER.—"An improvement in the manufacture of flexible bottles or cases for containing colors and other fluids and semifluids."—*This invention did not proceed to the Great Seal.*—It consists in applying gutta percha or "a mixture of gutta percha and india rubber, as above. Each bottle, &c. is made tubular" and thin, so as to be pressed flat; one end is made with a neck closed by a capsule of gutta percha. The other end or bottom is left open to allow of the bottle, &c. being filled with the color, &c., with one end longer, so that "it may be folded and cemented over on the other side."

[Printed, 3d.]

A.D. 1856, February 29.—N° 524.

TURNER, WILLIAM ALLEN.—"Improvements in the manufacture of elastic tubing." These relate "to tubing made of

600 INDIA RUBBER AND GUTTA PERCHA :

" india rubber or caoutchouc and gutta percha, either separately  
 " or in combination, and is designed for the purpose of rendering  
 " such tube capable of withstanding a pressure," and consists in  
 covering a helix or a series of rings of metal with the aforesaid  
 elastic material, and, if necessary, subjecting the tubing so made  
 to the ordinary vulcanizing process or to the process described in  
 the Specification of Patent, N<sup>o</sup> 305, 1856.

[Printed, 3*d*.]

A.D. 1856, March 10.—No 581.

NOLET, PIERRE DENIS.—"Improvements in pen-holders."  
 These consist "in substituting for the stamped, slotted, or other  
 " kind of construction of sheet metal holder ordinarily in use, a  
 " small caoutchouc tube affixed to the ordinary wooden rod or  
 " other handle." "The small caoutchouc tube has also a folded  
 " end or tongue for the purpose of holding the pen securely and  
 " enabling the elastic force of the tube to securely grasp the  
 " metallic pen, whilst it permits of a sufficient yielding to accom-  
 " modate the hand of the writer."

[Printed, 5*d*.]

A.D. 1856, March 12.—N<sup>o</sup> 596.

PALMER, CHRISTOPHER RICHARD NORRIS.—"A new tele-  
 " graph and improved telegraph or signal apparatus, parts of  
 " the invention, apparatus, or manufacture being applicable to  
 " other purposes."—*This invention received provisional protection,*  
*ut notice to proceed with the application for Letters Patent was*  
*not given within the time prescribed by the Act.*—It consists in  
 " causing a partial or sufficient vacuum in one, two, or more  
 " distant signalia, cylinders, or air vesels," connected "with a  
 " steam or sailing ship, railway train, mine, coal pit, or building,"  
 by "a metal, gutta-percha, vulcanized india-rubber, or other  
 " conductor tube of about  $\frac{3}{16}$ ths to  $\frac{1}{2}$  inch inner diameter, whereby  
 " motive power is obtained to effect sounding or detonating  
 " signals of unlimited power." "Also steam whistle signals by  
 " means of atmospheric pressure acting upon such distant pis-  
 " tons, or causing vulcanized india-rubber or other air-tight  
 " vessels in distant cylinders to collapse," &c., &c.

**AIR, FIRE, AND WATER PROOFING. 601**

See "Abridgments of Specifications upon Electricity, Magnetism," &c.

[Printed, 10d.]

A.D. 1856, March 12.—N. 600.

**CORBITT, WILLIAM, and SHAW, GEORGE.**—"Improvements in buffer, bearing, and draw springs for railway and other carriages."—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—When metallic elliptic springs are employed, placing them "in a box or case singly, and not on each other in a succession of plates, as in the ordinary springs; and in the interior of the case are made slides or grooves for the plunger to work in, by which the bearing is increased in proportion to the action of the buffer or spring." "At or near the centre of the springs, where they touch each other, are placed india-rubber rings; so that, when in action and driven home, the india rubber, being in the interior of the springs, will prevent them from coming in contact with each other, and will present an additional resisting force by its elasticity," &c.

[Printed, 3d.]

A.D. 1856, March 22.—N° 682.

**SCHELHORN, GUSTAV GEORG ANTON LUDWIG MICHAEL.**—"A new or improved penholder," "in which the pen is held by being pressed against the concave surface of the metallic tube or barrel of the penholder by means of vulcanized caoutchouc or india rubber, or other substance or mixture having the same or nearly the same elasticity as vulcanized caoutchouc or india rubber."

[Printed, 6d.]

A.D. 1856, March 25.—N° 703.

**GIZARD, LOUIS ANTOINE.**—"Improvements in elastic mattresses and cushions."—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists

602 INDIA RUBBER AND GUTTA PERCHA :

" in substituting for the iron springs in mattresses pieces of " caoutchouc" as follows :—" Each piece is about three inches " long by two inches wide, and is terminated at its two extre- " mities by two rings, of which the first is traversed by a small " rod resting on the cross piece of the mattress," " and the other " receives a cylinder which presses at will. The end of the " cylinder is surmounted by a wooden headpiece, moveable in all " directions, and of about two and a half inches in breadth. " The cylinder passes into the cross piece of the mattress, and its " extremity is retained by the piece of caoutchouc at the lower " part. Above the cylinder the bedding is placed." " It is also " applicable to cushions, chairs, and other like purposes."

[Printed, 5d.]

A.D. 1856, March 26.—N° 720.

DAFT, THOMAS BARNABAS.—" Improvements in the manufac- " ture of metallic and other bedsteads, and articles of metallic " and other furniture." Of these improvements, of which there are several, one is said to be in "the method of giving elasticity " to the metallic laths of bedsteads, and other articles of fur- " niture, by the use of vulcanized india rubber." A lath is made of two half laths, the two ends of which are introduced into a hoop of iron containing a ring of vulcanized india rubber, and to which the two ends of the lath are attached by means of iron rings.

[Printed, 7d.]

A.D. 1856, March 29.—N° 759.

MUSCHAMP, WILLIAM.—" An improvement in the manu- " facture of paper in order to render the same waterproof. It consists in saturating dry or semi-dry paper with a solution of alum, soap, glue, and gum arabic, as follows :—In one vessel alum is dissolved, in a second soap and borax are dissolved, and in a third gum arabic and glue. All of these substances are dissolved in given proportions. These solutions are mixed, and the paper is " conducted into and through such compound " solution, &c." The borax may be dispensed with,

. [Printed, 3d.]



A.D. 1856, March 31.—N° 771.

HAICHOIS, CHARLES JEAN LE MÉLOREL DE LA.—“Certain improvements in paving.” These consist “in the employment of lime, sand, asphalte, caoutchouc, gutta percha, and marine glue and wood for the purpose of forming an even and durable pavement.”

[Printed, 3d.]

A.D. 1856, April 7.—N° 844.

FULLER, WILLIAM COLES.—“Improvements in constructing and adapting india rubber as tyres for wheels.” These are, “making the tyres of india rubber and canvas combined, so as to be non-elastic.” In preference, “wind the material, viz. the combined canvas and india rubber, round the surface of the wheel itself, and submit it to vulcanization;” and “also fixing the india-rubber tyres on to the outer rim or felloe of the wheel” by any suitable means, or “by the aid of projecting discs or rims, one or both of which may be moveable when required.”

[Printed, 7d.]

A.D. 1856, May 8.—N° 1076.

PERREAUX, LOUIS GUILLAUME.—“An improved valve.” This consists “of a short passage of vulcanized caoutchouc or other suitable flexible material,” of a certain form “somewhat resembling the mouthpiece of the musical instrument called a hautboy.” The sides gradually taper upwards, and terminate in two long narrow lips at the top, “which open freely to allow the passage of an upward current,” and “are firmly compressed by a downward pressure of fluid.”

[Printed, 8d.]

A.D. 1856, May 9.—N° 1100.

BEAUCHÉ, LOUIS.—“A machine for the manufacture of cigars.” This consists “in the use and employment of short endless bands of vulcanized india rubber revolving in contact with each other by suitable means.” The bands move upon rollers, and in different directions, “thus imparting to the tobacco a similar movement to that produced by rolling the tobacco

604 INDIA RUBBER AND GUTTA PERCHA :

" between the two hands." There are other arrangements for finishing, &c. the cigar.

[Printed, 9d.]

A.D. 1856, May 14.—N° 1138.

SCOTT, URIAH.—"Improvements in public carriages, and various parts of the same, which parts may be used separately, and applied to vehicles of any description." Of these improvements there are several, and one is said to consist in "combining felt or india rubber with metal or earthenware in making bearings and axles, and so isolate them and prevent vibration;" and also "in making the wheels, and the various parts in combination, with felt, india rubber, or similar material, to make them elastic."

[Printed, 10d.]

A.D. 1856, May 20.—N° 1191.

GOLLOP, JAMES ANNING.—"An improved method of excluding dust, water, air, and other extraneous matters from doors, windows, glass, show cases, and such like constructions." This consists, with doors, in adapting thereto vulcanized india rubber or other small elastic tubing "to those parts of the door jamb against which the door rests or abuts when closed, and also to the lower rail of the door," &c. And with windows, glass show-cases, &c. adapting similar tubing. The elastic tubing is fixed to a rebate formed on the edge of the window sash, so that when the parts are in their place, "the surface of the elastic material is flush, or nearly so, with the edge of the sash frame," &c.

[Printed, 10d.]

A.D. 1856, May 26.—N° 1257.

JEUNE, FREDERICK CHARLES.—"An improved manufacture of floorcloth." This consists as follows:—Mixing in a masticator "india rubber (consisting in parts of the cuttings and waste of vulcanized india rubber) and gutta percha," afterwards adding "ground cedar wood or other vegetable dust;" and, lastly, adding "fibrous substances in length, such as cocoa-nut fibre, hemp, cotton waste, and hair." This compound is afterwards rolled into sheets, which are submitted to dry or steam

heat, "to about the temperature of three hundred degrees Fahrenheit, when they are painted."

[Printed, 3*d*.]

A.D. 1856, June 2.—N° 1299.

GIDLEY, GUSTAVUS, and CHRISTOPHER, WILLIAM.—  
"Reducing the bottle or imported india rubber to a transparent liquid state, so that it may be used as a transparent varnish or solution for mixing with colors." The india rubber is cut into pieces, and boiled with an alkaline solution, carbonate of soda preferred, for forty to sixty hours, and then for four or five hours in water; afterwards it is "dissolved in like manner to that heretofore practised when using crude india rubber."

[Printed, 3*d*.]

A.D. 1856, June 6.—N° 1348.

HARLOW, ROBERT.—"Improvements in the construction of waterclosets, and in valves or taps for waterclosets, and other purposes." These consist, first, in a "self-acting watercloset, the seat of which, when depressed, opens a tap or valve to admit water into a tube furnished above with a ball valve, which may be of vulcanized india rubber, and which closes the air passages when the tube is full, and when the pressure is removed from the seat the water in the tube is admitted into the pan to cleanse it out." Second, "in the application of the improved ball valve, above referred to, to the cisterns of other waterclosets, and to other purposes." Third, "in the application of a tube of vulcanized or other preparation of india rubber placed around the spindle of valves or taps within the valve chamber, whereby the stuffing box is dispensed with, and the valve raised off it seating when required." Fourth, "in the application of a ball clack, made of vulcanized india rubber or other suitable material, placed between the orifice of the pipe to be supplied and the end of the supply pipe."

[Printed, 7*d*.]

A.D. 1856, June 10.—N° 1373.

SKAIFE, THOMAS.—"Spring-folding camera shutters, for the more speedy and convenient mode of taking photographic pic-

606 INDIA RUBBER AND GUTTA PERCHA:

"tures than has been hitherto adopted." First, substituting for "the ordinary dark slide or shutter made use of in the camera for covering the sensitive plate a pair of folding shutters, arranged so as to open and shut inside the camera by means of a small cord passing round and connected with two drums, &c. "On the "surface of these drums" "is fixed an india-rubber elastic band, "or any other spring, in such a way that, when the drum or "drums from any force are caused to rotate, the action of the "springs when the force is removed will bring them back to their "original position," &c. Second, "in adapting a second pair of "shutters similar to the former," &c., &c.

[Printed, 3d.]

A.D. 1856, June 17.—N° 1430.

BAKEWELL, FREDERICK COLLIER (*a communication from John Lippincott*).—"Improvements in percussion bomb shells." In these improvements one is said to be "the use of an india-rubber tube, or its equivalent, for preventing the accidental or "premature explosion of the shell." "From the apex of the cell "a circular hole, tapering gradually downwards, enters the "powder chamber;" in this a percussion cylinder, perforated with a cylindrical bore, is fixed; in this percussion cylinder is a piston, ordinarily retained in its place by an india-rubber tube, but which explodes, a wafer of fulminating powder by being driven against it when the shell strikes any object.

[Printed, 6d.]

A.D. 1856, June 20.—N° 1451.

MONCKTON, EDWARD HENRY CRADOCK.—"Improvements "in pianofortes."—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time required by the Act.*—It consists "in employ- "ing, in lieu of the present buffing leather or otherwise, vulcanized "india rubber, preparations thereof, or india-rubber webbing, or "similar fabrics, to be used separately or conjointly with the "ordinary buffing materials at present employed in the various "mechanical portions of the action, such as the hammer heads,

“ under levers, hoppers, and hopper springs, and in place of the  
 “ balance weights in the key-boards; such materials being also  
 “ applicable for placing upon the hammer rests and rails, and in  
 “ all portions of the instrument where the ordinary padding or  
 “ baize is now made use of.”

[Printed, 3d.]

A.D. 1856, June 21.—N° 1461.

DAVIES, GEORGE (*a communication from Reuben Shaler*).—  
 “ Improvements in apparatus for measuring and indicating the  
 “ leakage of vessels.” These principally consist “in giving  
 “ motion to an index for showing the depth of water in the hold  
 “ of a vessel by the compression of air within a tube by the rising  
 “ of the leakage water.” “The lower end” of the tube “is  
 “ immersed in the water, and reaches down to nearly the bottom  
 “ of the hold, and its upper end extends to a convenient height in  
 “ the cabin or other suitable part of the vessel. At the upper end  
 “ of the tube a chamber is formed, the upper part of which is  
 “ furnished with an elastic air-tight cover formed of india-rubber  
 “ or other suitable material, and composed of a series of annular  
 “ or diaphragm-shaped plates joined together alternately at their  
 “ outer and inner circumferences, so as to constitute an elastic  
 “ spring of a circular bellows form, the upper plate being made  
 “ entire for the purpose of preventing the escape of air through it.  
 “ The number of sections required to form the spring will depend  
 “ upon the depth of the hold of the vessel, a shallow vessel  
 “ requiring a smaller number than a deep one. To the upper  
 “ section of the spring a standard is connected, the upper part of  
 “ which is formed as a toothed rack, and gears with a small  
 “ toothed pinion, the spindle of which carries an index or pointer.  
 “ This index moves over the surface of a dial.”

[Printed, 3d.]

A.D. 1856, June 24.—N° 1478.

TAYLOR, JOHN.—“An improved vessel for containing chemi-  
 “ cals for the generation of disinfecting gases,” “which, when  
 “ desired, may be readily and securely closed to prevent the escape  
 “ of the gaseous products.” “This is effected by fixing above  
 “ the mouth or orifice of a vertical vessel of glass or earthenware”

608 INDIA RUBBER AND GUTTA PERCHA :

" a cross bar of wood or other non-corrosive substance; the cover of the vessel, having attached to its under side a ring of vulcanized india rubber, is fixed to a screw which works through a nut formed in the before-mentioned cross bar over the centre of the orifice or mouth." " By the action of the screw the cover attached to it may be depressed, so as to compress forcibly the india-rubber ring between the cover and the margin around the orifice of the vessel, and effectually to close the latter." " By contrary action it may be as readily opened to permit the confined gases to escape."

[Printed, 9d.]

A.D. 1856, June 27.—N° 1512.

FORD, ALFRED.—"Preparing and dissolving in naphtha or oil of turpentine vulcanized india rubber, for the purpose of waterproofing, and for all or any of the other purposes for which the same, not so prepared and dissolved, is now applicable, and especially for the coating of iron ships' bottoms."—*This invention did not proceed to the Great Seal.*—The rubber is cut into small pieces, and placed in a boiler having a stirrer; heat is applied under pressure, but not exceeding "300 degrees of Fahrenheit;" "and when the india rubber shall be reduced to the consistence of dough," it is mixed with French chalk, and passed through rollers, "after which it is capable of being dissolved in naphtha or turpentine in the manner of ordinary rubber."

[Printed, 3d.]

A.D. 1856, June 28.—N° 1523.

REID, ROBERT.—"Improvements in the treatment or preparation of oils to be used for lubricating." — *This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists "in giving oils an increased body by dissolving gutta percha therein." "This mode of treatment is more particularly suited for application to mineral oils, or oils derived from minerals," but "may also be applied to other oils, where the increase of body which it gives is desirable, when such oils are to be used for lubricating purposes."

[Printed, 3d.]

A.D. 1856, July 1.—N° 1546.

DERING, GEORGE EDWARD.—“Improvements in galvanic batteries.” Of these improvements, of which there are several, one is said to be “protecting the metals of galvanic batteries at or about the surface of the liquid,” by “a covering of gutta percha or other suitable material,” preferring “sheet gutta percha, of about one sixteenth of an inch in thickness,” which is “attached to the metal by any suitable cement impervious to the acid.”

See “Abridgments of Specifications upon Electricity Magnetism,” &c.

[Printed, 4d.]

A.D. 1856, July 3.—N° 1561.

EWING, JOSEPH.—“A new or improved portable receptacle for urine and other human secretions.”—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists “of a bag or napkin made of india rubber, or vulcanized indian rubber, with a series of pouches or reservoirs connected therewith, and fastened round the hips with an elastic belt lacing in front,” &c.

[Printed, 3d.]

A.D. 1856, July 5.—N° 1575.

TRAVIS, EDWIN, and CASARTELLI, JOSEPH LOUIS.—“Certain improvements in steam engines.” In these improvements one is said to be “in the application and employment” of an “elastic valve, whether formed of india rubber or other suitable equivalent;” and also “the use of a piston having passages formed therein for the admitting of air, steam, water, &c., which are opened and closed” by an “elastic valve.” To the bottom of the piston a piece of india rubber is attached by means “of a metallic cone or curve,” which covers the steam, &c. passages when the piston is depressed in the cylinder, and allows the passages to be open when the piston is elevated in the cylinder, &c.

[Printed, 6d.]

610 INDIA RUBBER AND GUTTA PERCHA :

A.D. 1856, July 7.—N° 1595.

LAING, WILLIAM.—“Improvements in stretching or breadth-  
“ ening woven fabrics.” These are, applying and using in  
machinery, &c. employed for the above purpose, “by means of  
“ revolving rollers or drums,” a “web of caoutchouc or other  
“ sufficiently elastic material, which is passed in between the  
“ fabric and the drum or roller surface,” which, “by its elastic  
“ yielding action, saves the fabric” from “liability to damage.”

[Printed, 8d.]

A.D. 1856, July 16.—N° 1674.

DUNCAN, THOMAS.—“A combined and compound engine for  
“ applying motive power, and for measuring fluids.” In con-  
structing the above it is proposed to make “the work piston” of  
“a composition formed by mixing together gutta percha and  
“ blacklead,” and also to make the valve slides by preference of  
“vulcanite or hard india rubber.”

[Printed, 10d.]

A.D. 1856, July 21.—N° 1724.

GREEN, WILLIAM.—“Improvements in treating, ornamenting,  
“ and waterproofing fabrics, and in machinery or apparatus for  
“ effecting the same.” First, “producing artificial leather by  
“ combining a thin membranous material, or slivers of fibrous  
“ materials, of the desired color, to a woven or to a felted fabric.”  
Second, “uniting continuous lengths of paper or slivers of  
“ fibrous material to woven or felted fabrics, by means of gutta  
“ percha, or a solution of india rubber and gutta percha treated  
“ with sulphur or other vulcanizing matters.” Third, “coating  
“ fabrics with gelatin or gelatinous matters.” Fourth, “coating  
“ or partially coating fabrics on the wrong side, or that side not  
“ intended to be seen when in use, with paste or other matters  
“ capable of being easily removed, and of preventing unctuous  
“ matters from penetrating through the fabrics when applied  
“ thereon.” Fifth, “producing patterns or designs in various  
“ colours upon leather, cloth, or oilcloth previous to the applica-  
“ tion of the finishing oil, composition, or varnish.” Sixth,  
“coating fabrics with a flexible waterproofing matter treated



“ with vulcanizing agents, then with a gelatinous and saccharine matter, or with a farinaceous and resinous matter, and, lastly, with varnish, boiled oil, or otherfinishing composition.” Seventh, “ the use of rollers made of the composition usually employed for printers’ inking rollers, or rollers or pads covered with vulcanized india rubber, or made of other equivalent matters, for distributing varnish, oil, or other adhesive matters over fabrics.” Eighth, “ the employment of rollers in some cases covered with vulcanized india rubber for drawing fabrics beneath a scraper or trough while being supplied with varnish or waterproofing matters; also the application of water or other fluid (when so desired) to one of the said rollers when working in contact with waterproofing matters.” Ninth, “ the use of open-bottomed troughs, by preference kept warm, for applying and distributing varnish or other matters when making or preparing japanned, painted, or leather cloth.” Tenth, “ producing surfaces, similar to those known as leather, cloth, or oilcloth, to any desired pattern, upon portions only of plain, figured, or printed fabrics.” Eleventh, “ the use of perforated pattern plates.” Twelfth, “ the use of rollers having patterns indented upon their surfaces.” Thirteenth, “ giving various degrees of relief to enamelled or painted surfaces.” Fourteenth, “ the drawing of fabrics into or through a drying room by means of bands and pulleys connected with a spreading, painting, or printing machine with an engine or other prime mover, as also the suspending or holding of painted or varnished fabrics side by side, or one above the other, in a drying room, by means of clips, hooks, or pins fastened to their selvege or selvages, and running in or on grooves or guides.”

[Printed, *5d.*]

A.D. 1856, July 23.—N<sup>o</sup> 1744.

WEBSTER, WILLIAM (*a communication from Ambrose Tower*). —“ Improvements in pumps.” These are, applying and using “ elastic spherical or ball valves, composed either of solid india rubber,” &c., or having a nucleus of metal, &c., and covered “ with india rubber or other suitable material;” also, applying and using “ raised valve seats,” and applying and using the

612 INDIA RUBBER AND GUTTA PERCHA:

"elastic spherical ball valves" "in combination with raised  
"valve seats."

[Printed, 6d.]

A.D. 1856, July 23.—N<sup>o</sup> 1747.

BAIN, ALEXANDER, and HEYWOOD, BENNETT JOHNS.—  
"Improved apparatus for supplying and drawing off liquids, and  
"for stopping the flow of liquids and aeriform bodies."—*This  
invention received provisional protection, but notice to proceed with  
the application for Letters Patent was not given within the time  
prescribed by the Act.*—It relates, first, "to an arrangement of  
"air and water tight vent, applicable to cisterns and other vessels  
"containing liquids, and also to air cushions, swimming belts,  
"and other inflated articles, and to gas pipes, which arrangement  
"of vent forms a perfect substitute for the common tap or cock."  
This consists "of a vulcanized india-rubber tube, provided with a  
"rigid mouth-piece, and with a ring or other suitable contrivance  
"for holding the mouth-piece while the tube is in a bent position.  
"The tube when straight, or taking a natural curve, will permit  
"of air or water flowing freely through it as through an open  
"tap; and when it is required to stop the flow it is only necessary  
"to double the tube back upon itself, and a complete stoppage of  
"the tube will take place."

Second, "to the application of a floating tube to a cistern,  
"reservoir, or river, for the purpose of drawing off water at  
"variable levels, such levels being always above the turbid portion  
"of the stream or body of water and below the surface." "The  
"like result is obtained by the use of a rigid tube swinging on a  
"joint and borne up by a float."

[Printed, 3d.]

A.D. 1856, July 23.—N<sup>o</sup> 1749.

DERBYSHIRE, JOHN.—"Improvements in cocks, taps, and  
"valves." These are as follows:—A "tube of vulcanized india  
"rubber" "is enclosed in a box slightly shorter than its length  
"when uncompressed, so that it presses firmly and makes a fluid  
"tight joint against the top and bottom of the box." "Through  
"a hole in the top of the box a metal spindle descends, and,

" passing through the india rubber tube, is secured beyond it by a screw nut." " By means of a lever or key the spindle can be drawn up so as to raise the end of the india rubber tube out of contact with the bottom of the box, and thus uncover a hole therein through which the fluid escapes." " Self-acting valves may be constructed in a similar manner, only they require no spindle. The valve is raised by the pressure of the fluid in one direction, but it prevents the fluid from passing in the other direction." " In place of vulcanized india rubber, gutta percha or other elastic material may be used, but vulcanized india rubber is generally preferable."

[Printed, 9d.]

A.D. 1856, July 24.—N° 1756.

BOUSFIELD, GEORGE TOMLINSON (*a communication*).—" An improvement in the manufacture of driving straps or bands." It consists in " compounding fibres of cotton or flax with india rubber," producing a material to be used instead of leather. Rubber, when compounded with sulphur, is ground up with the above fibres; three pounds of rubber to one pound of fibre is preferred. Instead of pure cotton or flax, " scraps of cloth covered with rubber compound " " waste " may be used. " The fibrous compound obtained " is formed into sheets by passing between heated rollers, &c.

[Printed, 3d.]

A.D. 1856, July 24.—N° 1757.

BOUSFIELD, GEORGE TOMLINSON (*a communication*).—" Improvements in the manufacture of flexible hose and tubes " " of fibrous rubber, by powerful pressure, and without seams or joints." Rubber, when compounded with sulphur, is ground up with fibre, &c., as in N° 1756, 1856, and a sheet obtained in a similar way. Another sheet is obtained, and cut into pieces as long as the first sheet, and with bevelled edges, " and laid cross-wise on the first sheet with the edges overlapping each other;" a " third sheet similar to the first is laid on the top," and the whole passed through heated rollers. These sheets " are then cut of proper length and width," and rolled tightly round an iron rod " which regulates the size of the inside of the hose, and thus

614 INDIA RUBBER AND GUTTA PERCHA:

" forms a solid cylinder of fibrous rubber, which is to be placed" in a receiver ready to be forced through an aperture by the action of a plunger or piston, or the fibrous rubber produced without crossing may be put in a mass into the machine, and forced through an aperture round an iron rod the size of the hose.

[Printed, 6d.]

A.D. 1856, July 25.—N° 1764.

BOUSFIELD, GEORGE TOMLINSON (*a communication*).—"Im-  
"provements in the manufacture of vulcanized india-rubber  
"thread."—*This invention is void by reason of the patentee having  
neglected to file a Specification in pursuance of the conditions of  
the Letters Patent.*—It consists as follows:—"The india rubber  
"compound, having been properly masticated or ground, is,  
"whilst hot, rolled into a sheet between rollers, and is immedi-  
"ately divided into thread by rollers (one or both being grooved),  
"and the thread is then vulcanized by heat." "Or, in place of  
"cutting the sheets whilst in a hot and plastic state, as above  
"explained, the rolled out sheets may be subjected to artificial  
"freezing or cold, so as to set or harden the sheets, when they  
"may be cut in like manner to that heretofore practised in cutting  
"india rubber, and the thread thus produced may be then  
"vulcanized, as is well understood."

[Printed, 3d.]

A.D. 1856, July 25.—N° 1765.

SPENCER, GEORGE (*a communication*).—"Improvements in  
"the coupling of feed pipes of locomotive steam engines and  
"tenders." These are, "instead of the ball and socket joints,"  
using "a coupling, having rings of india rubber," by preference  
vulcanized, "so arranged that they allow," first, "of the angular  
"motion required by the engine in passing curves and points;"  
and second, "of the sliding motion required by the varying dis-  
"tances of the ends of the engines and tenders, and at the same  
"time form water-tight joints." The feed pipes, where they are  
to be attached to the sliding pipe, have the form of a conical  
chamber, and are attached to the sliding pipe "by rings of india  
"rubber, compressed by screws" as required, "and can be  
"pushed in or drawn out to allow of the second or sliding

" motion, while the hollow conical chambers " "allow of the first  
" or angular motion," &c.

Printed, 6d.]

A.D. 1856, July 26.—N° 1781.

YEADON, SAMUEL, and CHAPMAN, GEORGE.—" Improve-  
" ments in the construction of reeds for weaving, and in machi-  
" nery or implements and materials to be used in such construc-  
" tion." Of these improvements there are several, and one is  
said to be in " the composition and preparation of the cement,"  
and " the use and application of such cement or of gutta percha  
" alone, in uniting the parts of reeds." The cement in preference  
is composed of " pitch, gutta percha, and caoutchouc," in propor-  
tions varying " according to the quality of the reeds intended to  
" be made," &c.

[Printed, 1s. 6d.]

A.D. 1856, July 28.—N° 1785.

RITCHIE, GEORGE.—" Improvements in the manufacture of  
" boots and shoes from materials not hitherto used for that pur-  
" pose."—*This invention received provisional protection, but notice  
to proceed with the application for Letters Patent was not given  
within the time prescribed by the Act.*—It consists in making the  
heels and soles of boots and shoes wholly or in part of " gutta  
" percha, india rubber," &c., mixed with a hard mineral substance  
by preference " corundum " ground or broken into small pieces.

[Printed, 3d.]

A.D. 1856, July 29.—N° 1790.

LIVSEY, PETER JOEL.—" Improvements in arrangements and  
" mechanism for rotating and retaining the rollers of window  
" blinds."—*This invention did not proceed to the Great Seal.*—It  
consists first, " of a ring of metal, or other suitable substance  
" through which the cord or tape of the blind is passed ; to this  
" ring one end of a vulcanized india-rubber band is attached  
" and the other end is secured on a stud fixed in the window  
" frame," &c. Second, " applying a spring of india rubber or of  
" metal in the spiral or other suitable form, to exert a pressure

616 INDIA RUBBER AND GUTTA PERCHA :

“ on a ring or frame with an antifriction bowl, round which the  
 “ cord or tape of the blind roller passes, so as to keep a tension  
 “ on the cord or tape, to give force sufficient to rotate the roller  
 “ and retain it, and thus the blind, in any required position.”  
 Third, “ applying elastic cord or tape made of india rubber, or  
 “ india rubber covered or interwoven with thread or other fibrous  
 “ material, to the purpose of rotating blind rollers, and retaining  
 “ them in any required position; such elastic cords or tapes  
 “ (endless) may be passed round the pulley of the blind roller,  
 “ and round a fixed stud or an antifriction bowl, that is, round a  
 “ stud or antifriction bowl without an arrangement for adjust-  
 “ ment.”

[Printed, 3*d*.]

A.D. 1856, July 31.—N° 1811.

BROOMAN, RICHARD ARCHIBALD. (*a communication*).—“ An  
 “ improvement in the construction of carriages and waggons.” It  
 consists “ in the application of india rubber or other similar elastic  
 “ material to a variety of the parts, whereby not only is the rattling  
 “ noise arising from those parts when the carriage is in motion  
 “ entirely obviated, but also, by reason of the elastic character of  
 “ the material introduced, the bolts are not liable to break nor  
 “ the nuts to work off.”

[Printed, 5*d*.]

A.D. 1856, August 14.—N° 1911.

KNOWLES, JOHN, and CLARKE, WILLIAM. — “ Certain im-  
 “ provements in looms for weaving.” In these improvements  
 relating to the above subject, and of which there are several, one  
 is said to be, “ the use of gutta percha as a material for the  
 “ pattern straps of looms.”

[Printed, 7*d*.]

A.D. 1856, August 30.—No. 2020.

GOODYEAR, CHARLES. — “ An improvement in combining  
 “ gutta percha and asphalte or pitch.” Instead of employing  
 masticating machines, the substances are introduced into a close  
 vessel with water, and the temperature raised; they melt, and are

further mixed by stirring. "When in a comparatively fluid state, they may be further combined with sulphur, india rubber, or both," &c.

[Printed, 3d.]

A.D. 1856, September 1.—N° 2026.

BOWRA, MATTHIAS EDWARD.—"Improvements in the laying or placing of rails or chairs, and other purposes, in the shape of beds, or springs, or elastic sleepers." These are, constructing elastic sleepers, "by placing in, upon, or under the same an elastic material composed of vulcanized rubber, by itself, or mixed with other materials," "confined in a trough, case, or box, in order to prevent the squeezing out or spreading thereof;" also, fitting "vulcanized rubber washers, under or against the heads or nuts employed to fasten chairs when the same are borne by sleepers rendered elastic. Likewise constructing sleepers entirely of elastic materials," namely, "hardened rubber or vulcanite."

[Printed, 10d.]

A.D. 1856, September 3.—N° 2043.

METCALF, JOHN.—"Improvements in the manufacture and treatment of tar oil, for dissolving india rubber, gutta percha, gums, and gum resins, and also in deodorizing all fabrics, wood, or any article impregnated with tar oil, or the products from coal tar."—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists as follows:—To every gallon of "dead oil, crude oil, creosote, or heavy oil of tar obtained from coal tar by distillation," add "about two lbs. weight" of sulphuric acid, and "half a pound" of common salt, and agitate the whole; allow it to settle; draw off the liquid "without disturbing the pulpy precipitate;" add to the oil caustic soda, and lime, to neutralize any acid in it; separate the soda and lime, and put the oil in a still; and "distil in the usual manner until two thirds of the whole has distilled over." The whole of the above operations may be repeated upon the distillate. "All kinds of fabrics" "impregnated with india rubber, &c.,"

618 INDIA RUBBER AND GUTTA PERCHA :

are deodorized by "any alkali or alkaline earth," and wood, &c. is deodorized by the same means.

[Printed, 3d.]

A.D. 1856, September 8.—N° 2096.

NEWTON, ALFRED VINCENT (*a communication from Henry Davenport*).—"Improved machinery for cutting india rubber and "other substances into threads or narrow strips." The fillet of india rubber is strained over a pair of rollers, to which rotary motion is communicated for the purpose of presenting the whole surface gradually to rotary shears or cutters." "These cutters "are carried by a frame, which slides on transverse guides on the "table of the machine, situate about midway between the tension "rollers. By means of a screw shaft, which receives a slow axial "motion through a train of gearing driven from one of the tension roller shafts, the position of the cutter frame is shifted "laterally, so that the shears, commencing to cut at the edge of "the endless sheet, will slowly move inwards and cut up the "rotating sheet (as it passes between the cutting edges) into a "long continuous thread or strip. The strip, as it is formed, is "conducted away to a suitable reel. Nipping rollers are also "provided for holding the sheet of india rubber or other substance "up to the cutters."

[Printed, 10d.]

A.D. 1856, September 18.—N° 2193.

GOODYEAR, CHARLES, junior.—"Improvements in the manufacture of penholders, and handles for penholders." These are as follows:—"The usual compound of about two thirds "caoutchouc and one third sulphur" is preferred. This is made into sheets, about  $\frac{1}{8}$  of an inch in thickness, cut into slips, and wound upon a rod, "either parallel, or tapering to a point." These rods so covered are placed in a box of talc, &c., and heated till they become hard, &c. The hollow stem, thus formed, may be used as a handle, or made into a penholder, by introducing a plug into the larger end, "fitting loosely towards the end."

[Printed, 3d.]



A.D. 1855, September 20.—N° 2215.

FORD, ALFRED.—“Improvements in dissolving vulcanized india rubber for waterproofing and like purposes.” These are as follows:—The material, waste or otherwise, is cut up into small pieces, which are soaked “in oil of turpentine, or naptha spirit, “either prepared according” to process given in N° 2090, 1855, or otherwise; then transferred to a vessel heated by a steam jacket, with a still head and means of stirring. After some time the vulcanized india rubber becomes dissolved, and “is ready to “draw off.”

[Printed, 3d.]

A.D. 1856, September 26.—N° 2256.

PELLEN, MARIUS.—“Rendering impermeable by gas, caoutchouc, goldbeaters’ skin, paper, gauze, and similar materials “used for things adapted to receive an ascending force, such as “balloons, aerostatic machines, toys, &c., &c., by the application “of a peculiar varnish.” The differents kinds of varnishes employed consist of amilaceous, gummy, saccharine, and mucilaginous substances. These substances may be dissolved “in “water, or dilute alcohol, but never in any oleaginous body.” Collodion is mixed with a very small quantity of castor oil, say “from 5 to 6 per cent., and not prepared with ether.” A varnish is composd of “32 per cent. gum, 8 per cent. of sugar, and 60 per “cent. water,” or “28 per cent. of dextrin, 60 per cent. water, “and 12 per cent. gelatine;” “gelatine may be used alone, in 60 “to 70 per cent. of water,” &c., &c.

[Printed, 4d.]

A.D. 1856, September 26.—N° 2258.

HORSFALL, WILLIAM.—“An improvement or improvements “in cards for carding fibrous substances.” These are, first, taking the cloth, well known to the trade as “woollen card cloth,” and cementing to it “a thin sheet of caoutchouc, either in its “natural state” or vulcanized, or “coating the cloth with successive layers of strong india rubber solution.” Second, take a cloth, entirely of wool, and “cement to one side, with india- “rubber solution,” a “thin fabric, the warp of which must be

620 INDIA RUBBER AND GUTTA PERCHA:

" linen, but the weft may be cotton," &c. This compound cloth, cover, as above, with sheet caoutchouc.

[Printed, 3d.]

A.D. 1856, October 2.—N° 2305.

HARDON, EDWIN, and HENRY, JOSEPH.—" Improvements in " looms for weaving, and in machinery for communicating motion " to looms and other machines." Of these improvements, of which there are several, one is said to be, " making the straps, to " which the heddles are suspended or attached, of vulcanized " india rubber, or other suitable elastic or flexible material."

[Printed, 10d.]

A.D. 1856, October 2.—N° 2312.

GOODYEAR, CHARLES.—" Improvements in securing the " openings of air-tight and other bags and packages." For this purpose, " the edges of the opening or mouth made with flanges " or enlargements, which, when the package is to be closed, are " brought together, and a clamp, made in the form of a split tube, " is slid over them, which by means of screws is caused to press " the edges of the opening together, so as to make an air-tight " joint: or the bag or package may have a ring of metal or other " rigid material fixed to it round the edges of the mouth or open- " ing, and into the ring a door or plug is made to fit, and the door " or plug, or its seat, lined with elastic material, is pressed firmly " into its seat, and secured by screw fastenings or otherwise."

[Printed, 6d.]

A.D. 1856, October 3.—N° 2317.

JOHNSON, WILLIAM (a communication).—" Improvements in " the treatment, preparation, or manufacture of sheet caoutchouc. " and in the combination thereof with cloth and other fabrics." These consist in " desulphurizing " vulcanized caoutchouc by boiling the sheets in caustic alkali, and afterwards in salt pickle to neutralize the alkali, afterwards washing. These sheets are then ground with emery, sand paper, &c., so as to roughen the surfaces and give them " a velvety appearance. Cloth, &c. is applied means of a solution of caoutchouc. The caoutchouc may be

AIR, FIRE, AND WATER PROOFING. 621

extended, and in this state covered on each side with cloth. The goods thus produced may be made into boots, &c., in the usual manner, &c.

[Printed, 8d.]

A.D. 1856, October 10.—N° 2375.

PALMER, CHRISTOPHER RICHARD NORRIS.—“ A signaling apparatus for carriages, and improved telegraph or signal apparatus applicable to other purposes.” “ Placing along the roof or body of the carriage (say, for example, an omnibus,) a sufficient length of metallic or vulcanized india rubber or other tubing, of three sixteenths to a quarter of an inch diameter. One end will be brought close to the conductor, and into this end firmly fix or hang an air-whistle piece, made of hard vulcanized india rubber, or metal, or other durable material; or, in place of this air-whistle, make the tube communicate with a bell-sounding apparatus.” “ To the farther end, or any convenient part of the tube,” “ strongly attach or hang a small flexible and elastic ball, or half ball, or air holder, made or moulded wholly of vulcanized india rubber (capable of containing from one and a half to three cubic inches of atmospheric air).” “ Each of these elastic balls will thus hang or be fixed within manual reach of the passengers, and by quickly compressing (between the thumb and fingers or otherwise) either of the air balls, one, two, or more distinct whistles or sound signals may be instantly effected by any passenger.”

[Printed, 1s. 3d.]

A.D. 1856, October 15.—N° 2411.

TURNER, ARCHIBALD, and TURNER, LUKE.—“ An improved manufacture of elastic fabrics,” consisting of “ two woven fabrics sewed or stitched together, with strands of india rubber between them.” The strands “ are arranged longitudinally side by side,” and the fabrics placed on each side. The materials thus arranged are then sewed by yarns passing through the fabrics between the elastic strands,” &c., &c.

[Printed, 2s. 1d.]

622 INDIA RUBBER AND GUTTA PERCHA:

A.D. 1856, October 20.—N° 2460.

LORIMIER, ANTHONY.—“An improvement in re-working vulcanized india rubber.” It consists “in preparing the pieces or waste of vulcanized india rubber, by crushing the same between pressing rollers, then subjecting it to a considerable degree of heat, and whilst so heated causing it to be stirred, by which means the mass is progressively brought into a fluid state. The mass is then allowed to cool; but before becoming cold a solvent of india rubber is added, by which an india-rubber cement is produced, which may be used for spreading on fabrics and surfaces for the purposes of rendering the same water and air proof.”

[Printed, 3d.]

A.D. 1856, October 22.—N° 2481.

WALTON, FREDERICK.—“Certain improvements in the manufacture of brushes.” Of these improvements, of which there are several, one is said to be in “making the backs or mountings of brushes (containing cushions) of gutta percha, either by itself or in combination with tortoiseshell, ivory, papier maché, vulcanite, sheet metal, or other ornamental substances;” also, “when great elasticity is required,” “the wires are set in vulcanized or other suitable preparation of india rubber, to which a piece of cotton or other fabric is temporarily secured by paste or otherwise,” and “which is removed from the face of the india rubber, thereby leaving the wires set entirely in the india rubber.”

[Printed, 7d.]

A.D. 1856, November 6.—N° 2615.

WEBSTER, JAMES.—“A new or improved instrument or apparatus for transmitting hydrostatic and pneumatic pressure, which said instrument or apparatus is applicable to pressure gauges, safety valves, thermometers, pumps, and other like machines;” that is to say, “an instrument or apparatus in which a piston or moveable part works loosely in a cylinder or fixed part, the two parts being connected by a tube of caoutchouc supported within or without with a helical coil of wire,

“ and the application of the same to pressure guages, safety valves, thermometers, pumps, and other like machines.”

[Printed, 9d.]

A.D. 1856, November 8.—N° 2633.

MORPHET, WILLIAM. — “ Improvements in producing the velvet pile and Witney finish in cloths, and in machinery or apparatus for the same.” These consist in “ the use and application of machinery ” for producing the “ velvet and Witney finish,” and “ of india rubber for producing the Witney finish ”; also, “ the use of cards with straight teeth to produce the velvet finish.” To raise the nap or pile, and produce the Witney finish in woollen and other cloths, “ india rubber and wire cards are applied as the frictional surfaces to produce those finishes.” The machinery is as follows :—“ Two side frames are placed at distances apart suited to receive the breadth of the cloth. Between these side frames supporting rollers are placed, over which the cloth traverses while under operation. These supports are mounted so that they may be elevated or depressed to produce greater or less pressure of the rubbing surfaces on the cloth.” “ The rubbing surfaces to produce the Witney finish are faced with india rubber, by preference vulcanized. Other substances of a somewhat similar character or nature may be used in lieu of the india rubber.” “ To produce the velvet-pile finish, it is simply necessary to make the whole of the rubbing surfaces of wire card instead of india rubber.”

[Printed, 10d.]

A.D. 1856, November 11.—N° 2651.

BROOMAN, RICHARD ARCHIBALD (*a communication by N. Gail-lard*).—“ Improvements in the manufacture of boots and shoes and other like articles.”—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists “ in the means of uniting the uppers of boots, shoes, and other like articles, to the soles, or to the soles and heels, without stitching, gutta percha being employed to form the sole or heel, or part of the sole, or as the uniting medium.” “ Holes are punched in the leather or other material forming the ‘ uppers,’ and also in

624 INDIA RUBBER AND GUTTA PERCHA:

" the outer sole (where an outer sole of another material is to be used), or a sole or plate of gutta percha is to be added or interposed; heat and pressure are applied, whereby pegs, rivets, or pins will be started out from the gutta percha and into the holes punched, forming so many rivets to hold the parts firmly together." " A heel, made of gutta percha in a mould, may then be affixed by a solution of gutta percha, or a leather heel may be applied through a gutta-percha plate by rivets started therefrom, as for the uniting of the soles to the uppers."

[Printed, 3d.]

A.D. 1856, November 20.—N° 2746.

FOUNOBERT, CHARLES FRANÇOIS JULES (*partly a communication*).—"Improvements in the manufacture of boots and shoes."—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists "in covering the soles of boots and shoes with a composition of gutta percha and tar."

[Printed, 3d.]

A.D. 1856, November 20.—N° 2752.

EATON, RICHARD.—"Improvements in apparatus for buffing on railways, and for other purposes." Of these improvements, one is said to consist "in the modes of forming springs of thin vulcanized india rubber or gutta percha, or their compounds, in combination with or not in combination with spiral or volute steel springs." The springs consist of thin strips or discs of india rubber, of about half an inch thick, "arranged in a column or columns," with separating plates of metal, &c. These columns are guided by "one or more spindles passing through them." In some cases the surfaces of the "india rubber, or of the intervening plates, or both of them," are "ribbed, undulated, embossed, or perforated, so as to obtain various degrees of sustaining power or elasticity; and to attain the same object, the thickness and densities of the plates of the india rubber may be varied in the same spring."

[Printed, 11d.]

A.D. 1856, November 26.—N° 2801.

RIANT, LÉON GERMAIN.—“An improved mode of preparing “whalebone, gutta-percha, and other elastic bands employed in “the manufacture of wearing apparel.”—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists as follows:—“The material, such as whalebone, “gutta percha, and cane, employed for the bands, is cut and “notched at equal distances on both sides, the result of which is “to give it an amount of elasticity unattainable in its ordinary “state. It may be employed of any convenient thickness.”

[Printed, 3d.]

A.D. 1856, November 26.—N° 2804.

BLACKWOOD, JOHN.—“Improvements in ships.”—*This invention did not proceed, the Law Officer having refused provisional protection.*—It consists “of a peculiar mode of casing or lining “the interior of ships with caoutchouc, or with a composition of “caoutchouc and other similar material, so as to prevent the “ship from foundering from accidental causes.”

[Printed, 3d.]

A.D. 1856, December 3.—N° 2865.

RIDER, EMORY.—“Improvements in the manufacture or treatment of gutta percha.” These are, the mode of “treating “gutta percha by the addition to sixty-six parts of that gum of “one part of sulphur, or an equivalent thereof, and one part of “litharge, prior to the exposure of the same to the action of 235° “to 245° Fahrenheit, for the purpose of expelling the volatilizable “ingredients therefrom, and the after process of vulcanization “of gum so prepared by subjecting the same to a heat of 255° to “265° Fahrenheit.”

[Printed, 3d.]

A.D. 1856, December 6.—N° 2893.

HOOVER, WILLIAM, FRY, JOSEPH, and NASMYTH, GEORGE.—“Improvements in springs for railway carriages, and for other “purposes.” These are, the “construction of springs for

626 INDIA RUBBER AND GUTTA PERCHA :

“ various purposes by the employment of india rubber, whether  
“ vulcanized, mineralized, or otherwise treated, manipulated, or  
“ compounded, for the purpose of giving it an elastic character,  
“ when such materials or compounds are formed into tubes or  
“ sections of tubes, or into cylinders or rings, either of circular,  
“ square, or other section, and whether one such be applied  
“ singly, or several be used in combination,” “ when such  
“ forms are employed for the purpose of resisting compression  
“ by direct pressure, or by tractive force applied in the direction  
“ of their diameter.”

[Printed, 10d.]

A.D. 1856, December 8.—N° 2905.

EATON, RICHARD.—“ An improvement in the manufacture of  
“ springs when india rubber is used.” It consists in “ the con-  
“ struction of laminated springs of thin vulcanized india rubber  
“ kept separate by metal plates or divisions, the vulcanized india  
“ rubber not exceeding half an inch in thickness.”

[Printed, 10d.]

A.D. 1856, December 22.—N° 3034.

JOHNSON, WILLIAM BECKETT.—“ Improvements in steam  
“ engines and apparatus connected therewith.” In these im-  
“ provements one is said to relate to “ delivery or other valves made  
“ of india rubber.” “ The seat of the valve is made concave,  
“ and to this is adapted the india-rubber valve,” “ which by  
“ resting upon that form of seat will keep closer to the edge  
“ thereof when closed than if flat, as in the ordinary construc-  
“ tion.” The same object is accomplished by using the “ ordi-  
“ nary flat seats, but adapting valves which have been moulded  
“ into a concave form.”

[Printed, 10d.]

A.D. 1856, December 30.—N° 3097.

BROOMAN, RICHARD ARCHIBALD (*a communication from  
Madame Senèque*).—“ Improvements in manufacturing articles of  
“ earthenware and other ceramic materials, and in the machinery  
“ and apparatus employed therein.” In these improvements one  
is said to consist in “ the manufacture of flexible or expansible  
“ and colapsible counter moulds,” and “ the expansible mould



AIR, FIRE, AND WATER PROOFING. 627

" is constructed of india rubber or other flexible material, and  
" provided with an air chamber with flexible sides and rigid  
" top and bottom, into which air is admitted through a tap or  
" valve, and from which it is ejected in a compressed state into  
" the body of the templet," &c., &c.

[Printed, 7d.]

---

1857.

A.D. 1857, January 1.—N° 10.

LORIMIER, ANTONY.—" An improvement in preparing the  
" surfaces of printers' inking rollers, and other articles, when  
" vulcanized india-rubber is used." It consists as follows:—For  
a roller for distributing ink on a table, a tube of soft vulcanized  
india rubber is drawn on the stock of a roller, and in this state it  
is passed through a metal ring, which is " at a blood-red heat,"  
several times; then coat it " with dissolved vulcanized india  
" rubber," prepared as described in N° 2460, 1856. For inking  
type, scraps of vulcanized india rubber, with a little solvent, " are  
" granulated between crushing rollers," and mixed with a quan-  
tity of " dissolved vulcanized india rubber," prepared as above.  
This mixture is put into a mould, with " a stock or core previ-  
" ously coated with dissolved india rubber," it is pressed, and  
submitted for some hours to the temperature of boiling water, and  
finished by passing it " through a heated ring, and coating it with  
" dissolved india rubber " as above. " Printers' balls or dabbers "  
are prepared in a similar manner.

[Printed, 3d.]

A.D. 1857, January 8.—N° 67.

HUGHES, EDWARD JOSEPH (*a communication*). — " Improve-  
" ments in the manufacture and application of compounds resem-  
" bling gutta percha and caoutchouc, from flour, fibrine, gelatine,  
" and other vegetable and animal substances." These consist in

628 INDIA RUBBER AND GUTTA PERCHA:

" combining fibrin, starch, gluten, or substances containing them, " such as flour, with gelatine, resins, fats, oils, and substances " combining tannine." Examples are given of mixtures, and the proportions of each substance are also given. One mixture consists of wheaten flour, gutta percha, colophane, catechu, glue or gelatine, combined by heat. Another mixture consists of flour, colophane, caustic alkali of a certain strength, melted soap. The proportions of the ingredients may be altered according to the product required, and the compounds may be improved by exposure " to the action of hydrogen, sulphurous gas, sulphuretted " hydrogen, nitrous gas, or ammonia." These compounds may be employed for waterproofing and many other purposes, and they may be combined with fibres of all kinds, and a vast number of other substances. And they may be improved for some purposes by adding to them silicates, sulphates, or resinates of lime, linseed oil, varnishes, &c., and may be spun like glass, producing silky fibres.

[Printed, 4d.]

A.D. 1857, January 28.—N° 244.

HARLOW, ROBERT.—" Improvements in apparatus to be " applied to steam boilers." These are, in applying the glass tube to steam boilers, and in securing the glass tube to the taps by union joints and vulcanized india-rubber packings. " The glass " tube is connected to the metal sockets of the upper tap and " lower tap by union joints. These union joints act on vulcanized india-rubber packing rings, " thereby producing a steam-tight " joint without strain on the glass."

[Printed, 5d.]

A.D. 1857, January 29.—N° 266.

MCDONALD, JAMES RODERICK (*a communication from Nathaniel Hayward*).—" Improvements in the manufacture of india- " rubber over-shoes."—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists in " constructing the quarter and heel of vulcanized or hardened " rubber, or of rubber of greater thickness than that of which the " covering for the front of the foot is usually made; or of rubber

AIR, FIRE, AND WATER PROOFING. 629

"made sufficiently resisting or rigid to withstand the thrust of the foot while being inserted into the front of the over-shoe without lapping or falling down under the heel of the party putting on the over-shoe." Also, "affixing to the outer and back part of the heel, formed stiff, as aforesaid, a wedge-shaped or other suitably shaped projection, whereupon to apply the toe in order to remove the over-shoe."

[Printed, 3d.]

A.D. 1857, January 30.—N° 275.

ELLIS, THOMAS.—"Certain improvements in the preparation of india rubber and gutta percha, by combining therewith other materials."—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—Combining with india-rubber or gutta-percha certain metallic bodies, such as iron, copper, steel, or other amalgams of metal."

[Printed, 3d.]

A.D. 1857, February 6.—N° 340.

BROOMAN, RICHARD ARCHIBALD (*a communication from E. C. T. Courtelle*).—"Improvements in preparing or dressing threads and other fibrous materials, and in the machinery employed therein." These are improvements on an invention for which E. C. T. Courtelle obtained Letters Patent, February 3, 1852, N° 13,953. Of these improvements there are several, and one is said to consist "in covering the pressed rollers which work in the vessel holding the dressing material with vulcanized caoutchouc (or other similar gummy or resinous substance), instead of the cloth," &c. "The vulcanized caoutchouc" used "has the property of preserving its suppleness and elasticity constant and uniform under varying temperatures," &c.

[Printed, 10d.]

A.D. 1857, February 20.—N° 500.

JEUNE, FREDERICK CHARLES.—"An improved manufacture of artificial leather."—*This invention did not proceed to the Great Seal.*—It consists "in preparing an elastic compound composed

630 INDIA RUBBER AND GUTTA PERCHA:

" of masticated india-rubber, or india-rubber combined with gutta-percha, and mixed with sulphuret of antimony and woollen dust or waste," " and spreading it upon thin cotton cloth, then subject the same to heat." " The fabric is then ready to receive japan varnish."

[Printed, 3d.]

A.D. 1857, February 23.—N° 527.

SHEARMAN, JAMES EDWARD.—" Improvements in saddles and collars for horses and other animals." These are, " forming saddletrees wholly or partially of hardened rubber, or of hardened combined with vulcanized or cured rubber, or vulcanized or cured spongy rubber, or of a combination of wood or metal and vulcanized or cured rubber, or vulcanized or cured spongy rubber; also in forming the padding under saddletrees of rubber, rubber-web, or of a network of rubber-web or thread, or of vulcanized or cured spongy rubber. And forming collars of hardened vulcanized, or cured rubber, or vulcanized or cured spongy rubber, or of a combination of vulcanized or cured spongy rubber and leather."

[Printed, 5d.]

A.D. 1857, February 23.—N° 532.

KOCH, AIMÉ.—" Improvements in machinery for breaking and scutching flax, hemp, and other fibrous substances." These are, actuating the beating leavers of breaking and scutching machinery, described, " by means of cams or wiper levers mounted on rotating axes"; and in order to produce a rapid descent of the levers vulcanized india-rubber springs are used, and these are fixed at one of their ends to the levers, at a point near the axis on which they turn, and at their other ends to a longitudinal bar. By adjusting the strength of the springs " the force of the stroke given by the beater may be adjusted according to the nature of the work."

[Printed, 8d.]

A.D. 1857, March 3.—N° 626.

NEWTON, WILLIAM EDWARD (*a communication*).—" A preparation of materials for coating roofs, or other portions of

" buildings, to render them impervious to wet." This consists in using and applying for the above purposes "lime in combination with india rubber, gutta percha, and shellac solutions." The caoutchouc, gum, shellac, and gutta percha are dissolved in suitable solvents, and mixed in given proportions in one case to form what is termed "puzzolan," "pulverized glass, quicklime pulverized and sifted, and plaster of Paris or marble dust, or any kind of clay well vitrified and pulverized, or any equivalent substances;" and in another called 'smalt,' "vitrified glass, sand, flint, gravel, pounded earthenware, or any equivalent pulverized substances." "The use of lime is indispensable."

[Printed, 3d.]

A.D. 1857, March 10.—N° 699.

REYNAUD, CHARLES (*partly a communication*).—"Improve-ments in the application of india-rubber springs to mattresses, sofas, chairs, and other cushions or articles of furniture." These are, supporting "the india-rubber springs that carry and form the improved spring surface of the mattress, cushion, or other article on a number of wood rails over which the rubber springs are looped and disposed at suitable intervals throughout the area of the mattress." "These springs depend from the rail, and carry at the lower hoop or double a bobbin. This bobbin is placed on the lower end of a light metal frame, which surrounds and rises up on each side of the wood supporting bar. The upper part of this frame is flattened, and has perforations by which it is sewn or otherwise attached to the cross girth or webbings forming the upper part of the mattress." "The india-rubber springs preferred for this purpose" are mere rings which "are doubled over the wood rail and pass the two double ends down to the bobbin," &c.

[Printed, 7d.]

A.D. 1857, March 13.—N° 725.

JUVIN, EDMOND JOSEPH NICOLAS.—"Improvements in producing printing surfaces."—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists as follows:—The design, &c., is engraved on a sheet of

632 INDIA RUBBER AND GUTTA PERCHA :

tin, either by punches or otherwise; an impression is taken of gutta percha, which may be used to prove the work, or a plaster cast may be taken of it in which to make a lead casting. A coating of copper is precipitated on the engraved tin plate, and separated from the tin, has a backing of lead and antimony cast upon it to give it a substance. The lead casting is used "to produce a concave cast in gutta percha, which is submitted to a deposit of copper by electrical agency. The film of copper so deposited is then backed up with lead to form a block to print from."

[Printed, 3d.]

A.D. 1857, March 18.—N° 766.

TAYLOR, JOHN HORACE.—"Improvements in buckets and valve seats for bilge and other pumps."—*This invention did not proceed to the Great Seal.*—It consists "in providing an incorrodible seat to a spherical valve," so formed as to prevent the lodging thereon of any substance which may be brought up through it, of vulcanite or of hardened rubber, or of gutta percha, or of gutta percha faced with vulcanized rubber, and with a knife or sharp edge for the spherical valve or ball to rest upon." Also in "forming grooves round the outside of the bracket, and filling or packing these grooves with vulcanized rubber."

[Printed, 3d.]

A.D. 1857, March 20.—N° 777.

NINCK, JEAN.—"Improvements in placing sets or partial sets of teeth, gums, and palates on plates."—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists in the "use of gutta percha, india rubber, sulphur of zinc, vermilion, and proto-oxide of gold, in such proportions that the heat renders the amalgamation both hard and elastic," for the above purposes.

[Printed, 3d.]

A.D. 1857, March 28.—N° 865.

COWLEY, JOHN.—"Improvements in the manufacture of paper, and in utilizing certain refuse therefrom."—*This invention did*

*not proceed, the Law Officer having refused provisional protection.*—It consists as follows, first, combining with straw (as described in the Specification of Letters Patent, N° 1693, 18th July, 1856,) mangold wurtzel and beet root in certain proportions, and rendering this paper waterproof by the application before drying of certain chemicals; second, “drying paper by currents of air”; third, “using the refuse silica extracted from the straw as a ‘manure’”; fourth, “conveying and diffusing heat to the straw, &c. during pulping, bleaching, and making, by a ‘new means.’”

[Printed, 3d.]

A.D. 1857, March 28.—N° 870.

DEPLANQUE, LOUIS ETIENNE.—“An improved composition “for sharpening and setting fine-edged cutting instruments,” made by combining “certain vegetable and mineral substances “with vulcanized caoutchouc.” Several compositions are given consisting of caoutchouc, and two other substances. The substances named are, “emery, smoke black, plumbago, vegetable “charcoal, zinc white, yellow ochre, red ochre, pumicestone, “sulphur, marble, silex, millstone, brick, &c.” The “substances “reduced to powder and sifted are mixed with the vulcanized “caoutchouc by the ordinary processes, and the composition is “then moulded and otherwise formed into the desired shapes.”

[Printed, 3d.]

A.D. 1857, March 31.—N° 893.

DURANT, ANGUISH HONOUR AUGUSTUS.—“Certain improvements in omnibusses.”—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—Among the improvements, of which there are several, one is “in the application of gutta percha or elastic material to various parts of “omnibuses to prevent noise at such parts.”

[Printed, 3d.]

634 INDIA RUBBER AND GUTTA PERCHA:

A.D. 1857, April 3.—N° 931.

CRADDOCK, THOMAS.—“ Certain improvements in the steam “ engine and steam boiler.” These improvements are said to be “ supplementary ” to those for which Letters Patent were granted as follows :—N° 8432 and 11,473, N° 51 in 1852, and N° 1922 in 1854 ; and of these improvements, of which there are several, the following relate to this subject ; namely, “ the application of tubes, “ either of india rubber or thin metal, to the interior of pistons “ and stuffing boxes,” &c., for “ the purpose of presenting a stern “ or water-tight separation between the end of the cylinder or its “ representative, in which the impelling force is, and that of the “ end of the cylinder, which is exhausting itself of its previous im- “ pelling force.” These tubes are filled with water or other fluid by a supply pipe, in which there is a valve. Also, “ the application “ of india-rubber valves with hemispherical ends.” These are formed by a piece of india rubber, arranged “ in a brass hollow hemi- sphere,” which is perforated with holes of a certain diameter. Like- wise an arrangement of a piston rod with levers, and “ brass rings, “ having enclosed between them india rubber, which india rubber “ is held by the flanges,” joining together the parts which form the cylinder. “ In lieu of the india rubber, sheet steel may be “ substituted in some cases.” This arrangement, and modifi- cations of the same, are applicable to a great number of purposes. Several modes of applying vulcanized india rubber to the axis of the condenser “ where it vibrates, instead of stuffing boxes,” are given. And also arrangements wherein a disc or bag of india rubber is made to act as valves in “ hydraulic governors,” are described.

[Printed, 2s.10d.]

A.D. 1857, April 4.—N° 948.

JOHNSON, JOHN HENRY (*a communication from Madame Anna Chadbourne Morey, Widow of Charles Morey*).—“ Improvements “ in the manufacture of hard india rubber.” These are, first, mixing “ with the raw india rubber ” sulphur, finely powdered coal, or fine wood sawdust, preferring “ mahogany or rosewood ” in certain proportions. “ The vulcanizing process is begun with “ steam at  $3\frac{1}{10}$ ths atmospheres ” and brought to “ about  $4\frac{1}{10}$ ths “ atmospheres.” Second, using “ moulds of hard india rubber,” making such “ hard india rubber moulds from plaster casts of the



**AIR, FIRE, AND WATER PROOFING. 635**

“ articles to be moulded in the usual way, but in two halves, for the greater convenience of moulding,” &c.

[Printed, 3d.]

A.D. 1857, April 6.—N° 959.

**BOUSFIELD, GEORGE TOMLINSON** (*a communication*).—“ Improvements in treating india rubber and gutta percha, in order to render the same impermeable to illuminating and other gases.” These are, applying linseed or other siccative oil, in a heated state to the surfaces of tubes or vessels of vulcanized india rubber or gutta percha when in a heated state, or to the surfaces of tubes or vessels of india rubber or gutta percha combined with sulphur.”

[Printed, 3d.]

A.D. 1857, April 6.—N° 965.

**GOODYEAR, CHARLES**.—“ An improved manufacture of water-proof fabric, applicable as a substitute for leather, prunella, em broidered and other ornamental fabrics and stuffs.”—*This invention did not proceed to the Great Seal*.—It consists as follows:—The cloth or canvas is covered with cement, and the silk, eider down, &c. being dusted on, the goods after sometime are passed through rollers with a surface, preferred to be of vulcanized india rubber. These goods may be finely punctured, “so as to render them pervious to air while they are impervious to water.” These goods are vulcanized, and dyed, embossed, &c. &c.

[Printed, 3d.]

A.D. 1857, April 6.—N° 966.

**GOODYEAR, CHARLES**.—“ Improvements in the manufacture of waterproof boots and shoes, applicable also in part to boots and shoes of other kinds, and to other outer coverings for the feet.” These are, using for the uppers “perforated sheet india rubber,” &c., and cementing on “tips, heels, and side pieces,” which may be “vulcanized rubber in its plastic state,” and pressing the uppers so completed between dies or plates, one of which is grooved so as to corrugate “the inner face of the fabric,” &c. Also “applying tips, heels, and side pieces to the uppers of

636 INDIA RUBBER AND GUTTA PERCHA :

" boots, shoes, and slippers, so as to produce a compound fabric," as above described; likewise corrugating the inner surface of waterproof uppers for the purpose of assisting ventilation in boots and shoes. " Moulding the heels and soles of boots, shoes, and clogs of hard rubber, and applying thereto cushions or pads of elastic rubber," &c.

[Printed, 7d.]

A.D. 1857, April 9.—N° 1000.

ROLFE, THOMAS.—"Improvements in pianofortes." These are, " substituting a piece or pieces of india rubber, vulcanized or galvanized india rubber, or any other similar elastic material, suitably formed and rigidly supported on the key, or otherwise, in lieu of the elastic or yielding wire, as heretofore used."

[Printed, 6d.]

A.D. 1857, April 11.—No. 1015.

BUNKER, CHARLES J.—"An improved life preserver or life-preserving shirt or sack."—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists "of an article of dress, such as a shirt or chemise, so made of india rubber or other similar waterproof material as to admit of being inflated."

[Printed, 3d.]

A.D. 1857, April 13.—N° 1035.

MAURICE, JOSEPH.—"Certain improvements in the fastenings, fixings, and attachments used for supporting or securing artificial teeth in the mouth." These are, applying to such fastenings, &c. a covering "of vulcanized or mineralized or other soft and permanently elasticated india-rubber material, preferring to use it in the form of tubes," &c.

[Printed, 6d.]

A.D. 1857, April 13.—N° 1038.

GOODYEAR, CHARLES.—"Improvements in the manufacture of life-preserving apparel and other buoyant pliant articles."—*This invention did not proceed to the Great Seal.*—It consists in

making garments, &c. of two thicknesses of india-rubber cloth, cemented together at the edges, &c. Between these surfaces at the parts where cells occur introduce coiled metal springs, through which a tuft of wool or worsted is drawn, &c.; or, instead of metal springs, "use tubes of vulcanized india rubber as an elastic filling for the air cells," &c.

[Printed, 3d.]

A.D. 1857, April 13.—N° 1039.

NEWTON, WILLIAM EDWARD (*a communication*).—"Improve-  
ments in the construction of boats, buoys, floats, or other  
"buoyant vessels." These are, "the method of making boats  
"or other vessels of gutta percha, or of gutta percha mixed with  
"glue, so that the air chambers or other parts, if separately  
"formed, may, together with the boat body, be united and com-  
"pleted at one pressure, or (if the braces, knees, thwarts, sup-  
"porters, or other accessories to the boat proper are solid), that  
"the whole, with the inner and outer forms, may be all made or  
"completed together at one time and at one pressure."

[Printed, 10d.]

A.D. 1857, April 15.—N° 1063.

COUTTS, JOHN.—"An improved method of uniting together  
"the parts of all kinds of floating bodies composed of metallic  
"substances, as well as vessels for containing fluids, gases, &c.—  
*This invention received provisional protection, but notice to proceed  
with the application for Letters Patent was not given within the  
time prescribed by the Act.*—It consists in "the use and employ-  
"ment of an elastic substance, such as vulcanized india rubber,  
"gutta percha, kamtulicon, and the like," "which is placed  
"between the points of junction of the metallic lamina or sub-  
"stances." Also covering "the heads and shanks of the bolts,  
"rivets, or other connexions with some well known plastic sub-  
"stances, such as cement used by engineers, gutta percha," &c.  
Also employing an "elastic ring or washer around the said  
"bolts."

[Printed, 3d.]

638 INDIA RUBBER AND GUTTA PERCHA :

A.D. 1857, April 15.—N° 1066.

GOODYEAR, CHARLES, junior.—“An improved manufacture “ of paper knife.”—*This invention did not proceed to the Great Seal.*—It consists as follows :—“ Instead of rivetting a projecting “ tongue to the handle of the knife,” “ stamp or cut out a tongue “ in the handle of the paper knife, which tongue reduce in thick- “ ness to give it the required elasticity. The material known as “ hard rubber is preferred.”

[Printed, 3d.]

A.D. 1857, April 15.—N° 1071.

LEUILLET, JEAN BAPTISTE. — “Improvements in binding “ account and other books.”—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists in applying whalebone to the backs of books. The angles or edges of the book cover are made of or covered with gutta percha or india rubber.

[Printed, 3d.]

A.D. 1857, April 18.—N° 1101.

HEALD, HENRY.—“An improved method of packing pickers “ employed in looms.” This consists in packing “metal and “ other pickers with rubber elongated before, and while being “ inserted in the chamber,” and then “ allowed to expand so as to “ be retained therein.”

[Printed, 3d.]

A.D. 1857, April 23.—N° 1141.

WELCH, GEORGE.—“Improvements in metallic pens and pen- “ holders.” In these improvements one is placing “a tube of “ india rubber or other soft and flexible material upon any kind “ of penholder, so as to make the said penholder more agreeable “ to handle, and to prevent the pen held by it from inking the “ table or surface on which it is laid when not in use.”

[Printed, 5d.]

A.D. 1857, April 23.—N° 1148.

GARNETT, JOHN. — “Improvements in the construction of “corsets.” These consist “in the application of india rubber “stocking-wove fabric (commonly used for the purpose of making “elastic surgical stockings) to corsets constructed of coutil, jean, “or any of the numerous materials with which corsets are usually “made.”

[Printed, 3d.]

A.D. 1857, April 27.—N° 1185.

MACINTOSH, JOHN.—“An improvement in the manufacture “of air beds, cushions, and other like inflated and fluid-tight “apparatus or bags.” Employing a number “of india rubber “tubes, about five inches in circumference when inflated, and of “such a texture that it will readily stretch and yield to the “pressure of air forced into it by the mouth”; these tubes are enclosed in cases of tubular-knit fabrics of the description made, by what is ordinarily known as the circular machine, “which “tubes or cases of knitted fabric should, when unextended, be “about eight or nine inches in circumference, and be capable of “stretching to double that size,” &c.

[Printed, 3d.]

A.D. 1857, April 28.—N° 1196.

GRUNDY, DENNIS.—“Improvements in the manufacture of “boots, shoes, and clogs.”—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists in making the “soles of boots or shoes in two parts,” the heel and shank of wood, gutta percha, &c., and the sole of leather, gutta percha, &c., and unite “the two parts at the “shank with nails, rivets, &c., and, if desired, place or fix a spring “longitudinally, to yield or give way to the spring of the foot; “also attach to the heel, and soles where desirable, a piece of india “rubber or other elastic material, and cover the same with leather, “gutta percha, &c., “to prevent the unpleasant sound attendant “upon wood alone.”

[Printed, 3d.]

640 INDIA RUBBER AND GUTTA PERCHA :

A.D. 1857, April 28.—N° 1200.

CHADWICK, DAVID, and FROST, HERBERT. —“Improvements in apparatus for measuring water and other liquids and gas, applicable also to the purpose of obtaining motive power.” In these improvements, of which there are several, one is said to be “the application of india rubber as springs for keeping” cupped leather packing “of pistons in contact with cylinders of meters,” and “as applied to oscillating or rocking cylinders or chambers constructed of flexible materials,” &c.

[Printed 1s.]

A.D. 1857, April 29.—N° 1210.

JOHNSON, JOHN HENRY (*a communication from Poe Edouard Lemettais and Michel Boniere the younger*).—“Improvements in apparatus for distilling, applicable also to the extraction of oils, coloring matters and essences, and to the purification of gums,” and gutta percha is one of the substances described as treated as follows:—“Enclose this substance in the case or chamber,” and then “introduce the sulphuret of carbon, or any other suitable agent; then heat the apparatus by a current of steam, previously produced, at the required temperature. Care should be taken previously to place a filter in the interior of the apparatus, in order to retain all impurities, and to allow nothing to pass but voluble matter.” If necessary, “assist the solution by means of an agitator of some kind, placed in the centre of the cylinder, and driven by external mechanism,” &c.

[Printed, 11d.]

A.D. 1857, May 2.—N° 1245.

MARLAND, JOHN. —“Improvements in cop tubes used in spinning.” These are, first, “in the making of cop tubes of a combination of gutta percha and charcoal.” Second, the making cop tubes of a conical form, thicker at one end than at the other, when using gutta percha, and also when using compounds containing gutta percha.”

[Printed, 3d.]

A.D. 1857, May 4.—N° 1261.

TURNER, ARCHIBALD.—“Improvements in the manufacture of elastic fabrics, and for the application of such fabrics to the manu-

facture of boots and shoes."—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—  
 "Manufacturing an elastic fabric with an ordinary woven fabric  
 "for a foundation, and combining therewith strands of india  
 "rubber, which are secured by cross or weft threads that are  
 "thrown across by a carrier, such cross or weft threads being  
 "secured by two sets of warp threads that are worked by needles  
 and guides, in a similar manner to that shewn" in N° 2411, 1856,  
 or "causing the guides to shog to the right and left." "An  
 "elastic fabric without a woven fabric for a foundation may be  
 "produced by causing the needles as well as the guides to shog  
 "to the right and left." "Elastic fabric may be produced by  
 "throwing a weft thread across at the back of the fabric, and,  
 "securing or tying it in by means of the threads belonging to the  
 "needles, by causing the latter to pass over the cross threads  
 "when they are thrown across. The india-rubber strands are  
 "covered in front with the threads of the guides, which are  
 "shogged to and fro for the purpose, as in the former instance."  
 If an "ornamental edging be desired," it is produced by "causing  
 "the india-rubber strands to contract and pucker up the non-  
 "elastic fabric, which is extended to any required and suitable  
 "distance beyond the india-rubber or elastic strands, either on  
 "both or at only one selvage."

[Printed, 3d.]

A.D. 1857, May 4.—N° 1263.

HEYWOOD, BENNETT JOHNS.—"An improved construction  
 "of self-closing valve, and means for rendering the same appli-  
 "cable for supplying or discharging air, water, and other fluids."  
 —*This invention received provisional protection, but notice to pro-  
 ceed with the application for Letters Patent was not given within the  
 time prescribed by the Act.*—It relates to an improvement upon a  
 valve described in N° 115, 1856, and consists in extending "the  
 "application of the self-closing valve by making it hermetically  
 "close a tube." The valve is made of vulcanized india rubber, by  
 "preference, of a dished or cup shape, with a flange around it,"  
 and "across the valve cut a slit for the passage of the fluid," &c.

[Printed, 3d.]

642 INDIA RUBBER AND GUTTA PERCHA :

A.D. 1857, May 5.—N° 1265.

PITMAN, JOHN TALBOT (*a communication*).—"An improvement in the construction of currycombs." This consists in constructing, of india rubber or other elastic material of proper strength, a currycomb, combining a sufficiently stiff but elastic back with "a series of teeth of the same material raised upon it," "a part or all of which may be strengthened by wires or hooks of metal or other material," "by running in a melted state and pressing the material into a mould in which the hooks when used have been previously arranged." "The currycomb without the hooks makes an excellent flesh brush."

[Printed, 8d.]

A.D. 1857, May 8.—N° 1302.

TAYLER, CALEB.—"Improvements in the manufacture of sheets of material suitable for covering floors, and for other useful purposes." These consist, first, "in the combination of caoutchouc, gutta percha, and jintawan, in variable proportions, by means customarily practised, and incorporating therewith certain vegetable matters, either in a fibrous or in a divided state like sawdust, adding particular mineral and colouring ingredients, when desired." Second, "in manufacturing such compound material into sheets by the application of machinery usually employed, making the same to any required thickness."

[Printed, 3d.]

A.D. 1857, May 18.—N° 1397.

NEWTON, WILLIAM EDWARD (*a communication*).—"Improvements in the manufacture of boots, shoes, and other coverings for the feet." These are, "cementing the inner sole and welt, or to an outer sole, a sole and heel formed in one entire piece," and "composed of vulcanized india rubber or of any of the compounds of india rubber that are susceptible of being vulcanized."

[Printed, 5d.]

A.D. 1857, May 22.—N° 1439.

TAYLOR, JOHN GEORGE.—"Improvements in writing materials."  
—This invention received provisional protection, but notice to proceed



*with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists in inkstands and penholders. The inkstands are “a hollow flexible ball composed of india rubber “or other elastic material having an opening,” and having a spring which compresses the ball and forces the ink into a cup, &c. The penholders, composed of aluminium or hard rubber, &c. have an arrangement whereby the tube is supplied with ink by withdrawing the atmosphere, &c. &c. Penholders may have a guard balance to prevent soiling the fingers. “They may be composed of aluminium or any other metal, cork, hard india rubber,” &c. &c. “And a piece of pierced rubber, very thin, may be used “to run the penholder through.”

[Printed, 6d.]

A.D. 1857, May 25.—N° 1478.

UNDERHILL, WILLIAM SCOTT.—“Certain improvements in “wringing machines.” These are “making one or more of the “rollers used in such machines of vulcanized india rubber or “other elastic or resilient material,” or “covering such rollers “with elastic or resilient material.”

[Printed, 3d.]

A.D. 1857, May 27.—N° 1497.

CODET-NEGRIER, JEAN LÉONARD.—“Improvements in the “manufacture of boots, shoes, harness, and other articles.” These are, first, “the manufacture of all kinds of coverings for the feet, “garments, harness, by uniting and cementing the parts of which “they are composed.” Second, “the composition of the cement “for so doing is made of india rubber, gutta percha, and gum lac dissolved in sulphuret of carbon, sulphuric ether, &c., and sulphur may be added. These are mixed in certain proportions and in a certain manner, and the “gum lac is dissolved by means of camphine or by pure alcohol or used in fine powder.” Acids or “alkalies, such as soda, potash, ammonia, and others furnish the “means of uniting leather by the disruption or abrasion of the “surfaces, and submitting them to a perfect contact by means of “pressure.” Third, “the use of refuse parts of leather agglutinated and made into artificial leather.” This consists, besides of leather, of hair, different kinds of fibres, siccative oil, some gum

644 INDIA RUBBER AND GUTTA PERCHA :

resin, and gutta percha, &c. Fourth, a machine which is described  
“ serving to unite different pieces of leather by pressure.”

[Printed, 8d.]

A.D. 1857, May 27.—N° 1504.

DANNE, LOUIS JOSEPH ALMIDOR.—“ Manufacturing gutta  
“ percha glue, and applying the said glue to various new pur-  
“ poses.”—*This invention received provisional protection, but notice  
to proceed with the application for Letters Patent was not given  
within the time prescribed by the Act.*—It consists “ in melting  
“ gutta percha with rosin in a suitable pan, and mixing with it,  
“ when in a fluid state, if required, some hard powdered material,  
“ such as glass, sand, emery, pumice stone, &c. The propor-  
“ tions of the several compound materials are to be modified  
“ according to the nature of the applications of this glue.”

[Printed, 3d.]

A.D. 1857, June 2.—N° 1553.

BENTLEY, NEWTON, and ALCOCK, JOHN.—“ Improvements  
“ in machinery or apparatus for forging and stamping metals,  
“ which is also applicable to pile driving, crushing ores and seeds,  
“ beetling and fulling woven fabrics and other similar purposes.”  
These are as follows :—“ Attach one or more hammers, stamps, or  
“ fallers each to a vertical bar or slide, which rises and falls in  
“ suitable frames or bearings. On this vertical sliding bar fix a  
“ stud or pivot,” “ which, being acted upon by an intermittant  
“ spiral cam placed on a vertical shaft, causes the said hammer,  
“ stamp, or faller to rise and fall at any required distance, &c.”  
“ The spiral intermittant cam is formed by having upon a cylinder,  
“ shaft, or disc one or more spiral projections, either internally or  
“ externally, extending only over a part of its circumference,  
“ leaving a space or spaces between each terminus of the projec-  
“ tion.” The cam “ may be raised or lowered on the vertical  
“ shaft, and fixed in any desired position, for the purpose of  
“ adjusting the length of lift or stroke; or the position of the  
“ stud on the bar or shaft may be regulated for the same pur-  
“ pose.” This arrangement of apparatus is employed for stamping  
a number of substances, among which are “ caoutchouc and gutta  
percha.”

[Printed 10d.]

A.D. 1857, June 16.—N° 1679.

HOLMAN, STEPHEN.—“Improvements in force pumps.”—*—This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists in “applying thereto an “elastic compound valve in place of the ordinary arrangements “of clack and other valves. This valve is formed of a cup of “vulcanized india rubber, which is applied to the lower end of the “pump cylinder, which is pierced at that part with holes for the “discharge of the water from the cylinder. In the bottom of the “cup a tongue is cut, so as to form a clack valve, &c.” Another modification of this is described. It is proposed “to block them “with discs or rings of vulcanized india rubber, so arranged as “to press the leathers always against the inner periphery of the “cylinder.”

[Printed, 3d.]

A.D. 1857, June 18.—N° 1708.

DAY, HORACE HOLLISTER (*a communication*).—“Improvements “in preparing and vulcanizing india rubber, gutta percha, or “other analogous gums.” These are, “mixing with the matter, “when prepared for being vulcanized, a substance which will “prevent the cellular and spongy character, by absorbing the “sulphurous acid gas as fast as it is generated.” “The material “which is proposed to be employed for effecting this object is, “by preference, ordinary pipeclay (alumine); but other sub- “stances capable of absorbing the gas may be employed.”

[Printed, 3d.]

A.D. 1857, June 19.—N° 1710.

SOREL, STANISLAS TRANQUILLE MODESTE.—“New chemical “compositions, producing either house paintings, cement, or “plastic paste to be moulded.” Obtained by combining the following substances in suitable proportions:—First, “chloride “of zinc, or any other chloride which is amorphous with the “latter,” either chloride of iron or of manganese; second, a tar- trate; third, muriatic acid; fourth, a feculent or amylaceous sub- stance; fifth, water; sixth, oxide of zinc. “The said substances

646 INDIA RUBBER AND GUTTA PERCHA:

" are combined in various proportions, according to the nature of the products required. Any of the aforesaid substances may be replaced by others possessing similar properties; any of them could be omitted, and new ones could be added." " These new compositions can replace in a great many cases plaster, alabaster, marble, ivory, caoutchouc, gutta percha, gelatine, pasteboard, papier mâché, and several other substances."

[Printed, 4d.]

A.D. 1857, June 19.—N° 1717.

DAY, HORACE HOLLISTER (*a communication*).—" An improved method of treating or purifying gutta percha," which consists in subjecting it to the action of a liquor which dissolves out the etheric oil," and at the same time, " acting upon the woody matter, disengages the sand and other foreign matters held therewith." The liquor consists of a certain amount of caustic potash and water, to which is added an ether formed from a solution of chloride of lime in alcohol," " about four ounces of chloride of lime in eight ounces of alcohol." The gutta percha is placed in the liquor, and the whole " is brought to the boiling point, and kept in that state for eight or ten hours." The gutta percha is taken out, and rolled under water, " and may be vulcanized in the usual way." By adding a fresh supply of ether, " the liquor may be used for several parcels of gutta percha."

[Printed, 3d.]

A.D. 1857, June 20.—N° 1728.

RICHARDSON, BENJAMIN.—" Improvements in manufacturing and ornamenting articles of flint glass." In these improvements one is:—" In order to ornament such articles made of flint glass, parts or the whole of the surfaces thereof are to be coated, by preference, with a solution of gutta percha or india rubber, or it may be with other compositions, not acted on by acid; and from such coated surfaces parts of the coating are to be removed by any suitable tool, so as to produce thereon the desired ornamental device." " The composition preferred is gutta percha dissolved in a solvent, afterwards adding bees'-wax and tallow, all in certain proportions."

[Printed, 4d.]

A.D. 1857, June 20.—N° 1731.

BUNN, LOCKINGTON ST. LAURENCE.—“Improvements in the “ manufacture of Wellington boots.” These are, making the legs or upper parts of these boots of “ a waterproof woven “ fabric prepared to imitate leather either by means of india “ rubber combined with sulphur or matters containing sulphur, “ or waterproof woven fabrics coated and impregnated with drying “ oils and pigments,” preferred to be composed of two or more “ plies or layers cemented together by india rubber combined “ with sulphur, the fabrics so cemented being afterwards subjected “ to heat in order to produce the change.”

[Printed, 3d.]

A.D. 1857, June 26.—N° 1801.

HEYWOOD, BENNETT JOHNS. — “ Improvements in the “ manufacture of india-rubber goods.”—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists as follows:—“ Cover a sheet of green elastic rubber “ with a sheet of green hard rubber, and then apply over this a “ second sheet of green elastic rubber, after which submit the whole “ to pressure.” “ On converting this fabric by the application of “ heat in the well-known way, a strong semi-flexible material “ will be produced.” “ In order to increase the flexibility, it is “ only necessary to apply strips of the green hard rubber instead “ of a sheet; and these strips may be parallel, and run length- “ wise of the fabric, or they may be laid across and across, like “ lattice-work.”

[Printed, 3d.]

A.D. 1857, July 3.—N° 1861.

HENDRY, WILLIAM THOMS, and HANCOCK, ROBERT HENRY.—“Improvements in the manufacture of flexible tubes “ or hose pipes.” These are as follows:—A tube of fibrous matter is saturated with india rubber, gutta percha, &c. A tube of india rubber and gutta percha, &c. is drawn through this and is closed at one end, and filled with steam, air, or sand, &c., &c.; and, if necessary, cover the outer woven tube with india rubber or gutta percha, &c., and if not already vulcanized it may be sub-

648 INDIA RUBBER AND GUTTA PERCHA:

jected to that process. A mandrel may be made of a flexible tube of india rubber, gutta percha, &c., and filled with air, gas, sand, &c., as above. On this flexible mandrel a tube is made of india rubber, gutta percha, &c., and textile fabric. When the "pressure is removed from the flexible mandrel it is withdrawn."

[Printed, 4d.]

A.D. 1857, July 14.—N<sup>o</sup> 1950.

NYE, SAMUEL.—"Improvements in chaff-cutting machines." These are, "in passing the spindle (for the purpose of putting in motion the necessary wheels for obtaining different lengths of cut) through the rollers independent thereof;" also "the use of india rubber as a means of compression, instead of the usual side irons, lever, and weight."

[Printed, 3d.]

A.D. 1857, July 30.—N<sup>o</sup> 2075.

McKINLEY, WILLIAM, and WALKER, ROBERT.—"An improvement in the manufacture of moulds for forming the soles of boots and shoes."—*This invention is void by reason of the patentee having neglected to file a specification in pursuance of the conditions of the Letters Patent.*—It consists "in preparing and using an electrotype cast in the making of a mould for the production of like sizes and forms of soles of gutta percha or compounds thereof." "The 'upper' of such boot or shoe is prepared so as not to be injured by the acid used in the bath used to deposit the required electrotype cast." "The sole and a small portion of the 'upper' is to be made conductive, and placed in the solution; and the boot or shoe, with a last therein, is put into the solution and in connection with a galvanic battery, so as to have a metal coating (by preference, copper,) deposited thereon, which is removed and divided into two parts, and fixed by soldering in an iron or suitable frame or form."

[Printed, 3d.]

A.D. 1857, August 11.—N<sup>o</sup> 2149.

NEWTON, WILLIAM EDWARD (*a communication*).—"Improvements in pickers for looms." These are, "using and applying for the construction or manufacture of pickers for looms of hard

" compounds of india rubber or gutta percha," &c., "whereby pickers may be made without a seam." The hard compound is prepared as described in N° 12,542.

[Printed, 5d.]

A.D. 1857, August 12.—N° 2154.

CLARKE, WILLIAM ALEXANDER.—"Improvements in the construction of and mode of applying hot air and vapour baths." In these improvements, relating to the above subject, one is said to be "the use of a strong vulcanized india rubber or other elastic band or ligature, which, when applied to the limb, will compress the blood vessel, and stop the circulation while the limb is being operated upon in the bath."

[Printed, 10d.]

A.D. 1857, August 14.—N° 2164.

PARKINSON, JOHN.—"Improvements in the construction of pressure and vacuum guages." These consist in the application of gutta percha or other suitable incorrodible material to the tubes of pressure guages to prevent "oxidation, which in course of time reduces" the area of the tube, and causes the indications "to be incorrect."

[Printed, 6d.]

A.D. 1857, August 19.—N° 2203.

LUND, EDWARD.—"Certain improvements in cocks, valves, pumps, and water plugs."—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists "in a particular employment of atmospheric air or other elastic gas or gaseous compound, or vulcanized india rubber or other non-metallic elastic compressible material, to diminish the vibration or concussion which takes place in cocks, valves, pumps, and water plugs, when a stream of water or other fluid passing rapidly through them is suddenly stopped." When necessary, "to separate the air or gas from the water or other fluid, by means of a partition or diaphragm of leather or other animal membrane, vulcanized india rubber, liquid mercury," &c., is used.

[Printed, 3d.]

650 INDIA RUBBER AND GUTTA PERCHA:

A.D. 1857, August 20.—N° 2213.

SPILL, GEORGE.—“Improvements in treating fabrics employed in the manufacture of hats, caps, and bonnets, and for other purposes, and also other fabrics, so as to render the same impervious to moisture and grease.”—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists as follows:—“Dissolve india rubber or gutta percha to a pasty consistency in coal tar, naptha, or other suitable solvent, adding thereto powdered sulphur, and spread in a thin film the mixture thus obtained upon the fabric;” “then subject such fabrics to a high temperature, sufficient to change the nature of the compound, and prevent its decomposition by its contact with grease, as also to cause it to retain its permanent elasticity,” &c.; or “apply as a coating bees'-wax, dissolved, or in a liquid state, produced by heat, or a solution of gelatine,” to which “afterwards apply infusion of nutgalls.”

[Printed, 3d.]

A.D. 1857, August 20.—N° 2214.

CHAMBERLAIN, AMOS PIERCE.—“Improvements in machines for cutting corks and other substances.” These consist of a “system of knife and carriage,” “also applicable for cutting india rubber, caoutchouc, paper, and other substances.” “The knives are turned by means of a strap or leather band, or any other well-known manner for giving a fast motion; the strap or band is attached around the pulley.”

[Printed, 10d.]

A.D. 1857, September 4.—N° 2318.

TURNER, ARCHIBALD.—“Improvements in the manufacture of elastic fabrics.” These improvements relate in one instance to a fabric described in N° 2411, 1856, and consist “in bending or sewing together two non-elastic fabrics with a series of elastic strands between them.” This is done by “causing the guides which operate the longitudinal warp thread to shog to the right and left, so as to throw their threads to and fro over the india rubber strands, and thereby cover the latter, the threads of the guides being secured by the threads belonging to the



" needles that operate on the opposite side of the fabric." " An elastic fabric without a woven fabric for a foundation, but with longitudinal elastic strands therein, may be produced by causing the needles as well as the guides to shog to the right and left, so that they may be tied into one another at the proper intervals." " Another kind of elastic fabric may be produced by throwing a weft thread across at the back of the fabric, and securing or tying it in by means of the threads belonging to the needles, by causing the latter to pass over the cross threads when they are thrown across. The india rubber strands are covered with the threads of the guides, which are shogged to and fro for the purpose, as in the former instance." A modification of the above may be produced "by causing a cross or weft thread to be passed through a series of loops formed upon a row of needles which are passed through the fabric," &c.

[Printed, 1s. 8d.]

A.D. 1857, September 5.—N° 2323.

KING, JOHN (*a communication*).—"Improvements in the manufacture of boots and shoes, and in machinery for that purpose."—*This invention did not proceed to the Great Seal.*—It consists as follows:—Before placing "the upper leather and insole" in a machine, their edges are coated with a cement prepared by dissolving gutta percha and caoutchouc in certain proportions "in bisulphuret of carbon and mixing the solutions;" and they are pressed together in a machine, &c. "The heel is filled with a composition of gutta percha, white resin, or gallipot, or turpentine, scraps or raspings of leather and drying oil, heated and mixed together," &c.

[Printed, 3d.]

A.D. 1857, September 7.—N° 2334.

PARKER, BENJAMIN.—"A new elastic composition for coating, cementing, bedding, and otherwise protecting bodies, also applicable to the construction or formation of articles to which it may be suitable."—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—The elastic composition consists of india rubber, coal or other suitable tar, pulverised

652 INDIA RUBBER AND GUTTA PERCHA :

chalk, or other suitable material, sulphur, and flax or cotton waste, or other suitable material mixed in certain proportions, and formed into sheets, &c., and hardened by heat. "The hardening process is further aided by the assistance of sulphuric, muriatic, or any other suitable acid applied in conjunction therewith in any suitable manner."

[Printed, 3d.]

A.D. September 7.—N° 2336.

SCOTT, URIAH.—"Improvements in boots and shoes, applicable in part to shoes for horses." These are, first, using "india rubber in combination with metal and leather, or other suitable material, in the manufacturing of soles and heels of boots and shoes, and making them elastic when the pressure of the foot is exerted upon them." Second, "making the shoes of horses in one or more parts and placing india rubber or other elastic or soft material between the inner and outer shoe." And "corrugating the outer shoes to prevent the horses slipping, and nail them as usual."

[Printed, 6d.]

A.D. 1857, September 15.—N° 2389.

WALMSLEY, JOHN, and HOWARD, THOMAS.—"Improvements in machinery or apparatus for warping, sizing, or dressing and winding on yarns or threads." In these improvements relating to the above machinery, one is in setting the dents or teeth of the comb used in "guiding the yarn or warp threads to the warp beam," &c. in "ribs of gutta percha, or other tough material, so as to be able to bend or unbend the comb to any width of the beam flanges."

[Printed, 8d.]

A.D. 1857, September 17.—N° 2411.

PULVERMACHER, ISAC LOUIS.—"Improvements in apparatuses for creating electric currents, chiefly for medical purposes." In these improvements relating to the above objects, one is said to be, constructing portable flexible batteries of gutta percha, &c. (See "Abridgments of Specifications upon Electricity, Magnetism, &c.")

[Printed, 1s. 4d.]

A.D. 1857, September 18.—N° 2431.

BURTON, JOHN WATSON, and PYE, GEORGE.—“Improve-  
“ in the construction of rollers used for pressing fabrics and  
“ fibrous and other materials.” These are, “constructing the  
“ exterior surfaces of such rollers of rings of the hard compounds  
“ produced by subjecting india rubber, gutta percha, or mixtures  
“ thereof, together with sulphur, to high temperatures; the  
“ surfaces of the rollers under the rings being coated with or  
“ composed of vulcanized india rubber, to give flexibility and  
“ elasticity to the inner surfaces of such hard rings.”

[Printed, 3d.]

A.D. 1857, September 24.—N° 2469.

JOHNSON, WILLIAM BECKETT.—“Improvements in raising  
“ and lowering trucks, carriages, engines, or other such railway  
“ appendages from one level to another.” These are, first, “the  
“ use of the direct action of steam, hydraulic or pneumatic pres-  
“ sure, for the purposes above.”

Second, “the use of the stops acted upon by the ascending or  
“ descending load for cutting off the source of power, and  
“ exhaust.” Third, “the use of india-rubber abutments for the  
“ upper and lower situations of the platform, whether such abut-  
“ ments be used with direct-acting motive power or with other  
“ machinery.”

[Printed, 3d.]

A.D. 1857, September 29.—N° 2497.

LEJEUNE, EMILE ALBERT (*a communication from Joseph Jules Brunessaux*).—“An improved crupper.”—*This invention received provisional protection, but notice to proceed with the application for Letters Patent was not given within the time prescribed by the Act.*—It consists in employing “vulcanized caoutchouc for the manu-  
“ facture of horses’ cruppers in substitution of leather.”

[Printed, 3d.]

A.D. 1857, September 29.—N° 2498.

WHITE, WILLIAM WALL, and BULL, WILLIAM.—“Im-  
“ provements in rollers applicable for blinds, maps, and other

654 INDIA RUBBER AND GUTTA PERCHA :

" purposes." These are " the use of an india-rubber spring of any convenient form, or a spring of any substance, fixed to the framework on which the roller revolves, to which a cord is attached, the other end being passed over or fastened to the wheel on the roller, which has a ratchet for a catch on one side, and a drum (smaller in diameter than the roller)." Also the privilege of varying this mode by having a pulley fastened to the spring, the cord fastened to the pulley-wheel passing through the pulley, and being fixed to the bracket or framework of the window;" likewise " the use of these principles without the india-rubber spring, &c., the roller being made to revolve, and the blind being fixed in any position by a spring on the bracket."

[Printed, 8d.]

; A.D. 1857, October 1.—N° 2520.

LONG, JAMES, and LONG, JOSEPH.—" An improved method of and apparatus for ascertaining and registering the depth of water and the pressure of steam." It consists of a tube of glass, held in a frame, with a graduated scale at the sides of the tube, and a stopcock at the bottom; the top of the tube is hermetically closed by a packing or wad of vulcanized caoutchouc, except a small tube passing upwards from the glass tube through the caoutchouc, and which is bent downwards a short distance on the outside of the said tube. " A small bead or float," in preference " made of gutta percha, rests in the tube." The bottom of the tube rests upon " a vulcanized rubber washer," &c. It is stated " that a somewhat similar instrument has been before invented, but without elastic packing for the ends of the glass." And the invention is :—" The adaptation to sounding instruments, of the kind " of " vulcanized rubber-packings to receive and close the ends of the glass tubes."

A steam gauge is also described and claimed.

[Printed, 7d.]

A.D. 1857, October 6.—N° 2564.

KNAPTON, WILLIAM.—" Improvements in gasometers or gas holders, and in the application thereof to railway and other carriages and ships, for lighting the same with gas," " for the

' purpose of dispensing with the brick tank," and consist as follows :—" Form the upper part or cover, the bottom and a portion of the sides of the gasometer rigid with plates of metal or " gutta percha," and " connect these rigid parts together air-tight " by pieces of vulcanized india rubber or other suitable elastic material of about the same depth as the aforesaid metallic parts, " so that when the gasometer is empty the metal parts will fall " and cover one over the other. Support the gasometer by " counterbalance weights passing over pulleys, as is generally " practised."

[Printed, 1s. 2d.]

A.D. 1857, October 19.—N° 2674.

NEWTON, WILLIAM EDWARD (*a communication*).—" Improve- " ments in the manufacture of drawing rollers." These are as follows :—" The " electricity developed " by india rubber, " render- " ing it unsuitable for the " above " purpose;" " to divest the " india rubber (or gutta percha) of this power," it is incorporated " with a portion of plumbago or black lead previous to vulcaniz- " ing." A composition of " india rubber, magnesia, sulphur, and " black lead " in certain proportions is described. A tube is formed on a mandril of layers of cloth. Over these is the com- position temporarily covered with cloth while being heated. After vulcanization " this tube is cut into short sections, which are " secured to the drawing roll by any suitable cement."

[Printed, 6d.]

A.D. 1857, October 24.—N° 2707.

MACINTOSH, JOHN. — " Improvements in the construction " and laying of telegraphic cables." First, " coat the conducting " wire or strand with gutta percha or a compound of gutta " percha and india rubber, &c.; then fold round it, so coated, a " bat or fleece of fibres laid parallel to its length, and by means " of rollers or otherwise crush the fibres into the coating of " gutta percha, &c. Afterwards again coat the wire or strand " with gutta percha, &c., with which mix a quantity of iron " filings. In laying telegraphic cables pass the cable, when it is " clear of the ship, over a pulley suspended from the gaff or " other spar by long springs of vulcanized india rubber, and the

656 INDIA RUBBER AND GUTTA PERCHA:

"end of this gaff or other spar stay to the topmast by another  
"vulcanized india-rubber spring." "In order to keep this  
"pulley from heating, a stream of water may be caused to flow  
"over its bearings, or it may be enclosed in a case containing  
"water." "In order to assist the compensating action of the  
"springs, suspend from the spar which carries the pulley "a  
"metal or other basket or vessel, which ordinarily hangs a short  
"distance under the surface of the water, and is towed behind  
"the ship by a rope."

[Printed, 4d.]

A.D. 1857, October 26.—N° 2713.

DE CLIPPÉLE, CHARLES. — "Improvements in the manu-  
"facture of boots and shoes, harness, and driving straps, which  
"improvements are applicable to uniting various materials  
"together, and also for waterproofing." This consists in making  
a composition or cement of sulphuret of carbon and gutta percha,  
mixed in certain proportions, and applying it "for uniting  
"together materials, such as leather to leather, cloth to cloth,  
"or leather to cloth, for the manufacture of boots and shoes,  
"pipes, harness, and driving straps, iron to wood for uniting a  
"cannon ball to its cartridge, and for other articles;" for  
"waterproofing ropes, cords, cables, cardboard, pipes, cases,  
"trunks, boats, wood, and other articles;" also "for forming  
"rollers for spinning, and other articles, by moulding."

[Printed, 4d.]

A.D. 1857, October 31.—N° 2771.

BROOMAN, RICHARD ARCHIBALD (*a communication*). — "Im-  
"provements in the construction of boats." — *This invention did  
not proceed to the Great Seal.* — It consists "in the construction of  
"folding or collapsible boats." "The ribs, &c. are formed of  
"iron, and are all pivotted on the keel; the side plates are of  
"iron, united and made tight by an outer skin or casing of  
"caoutchouc, cloth," &c.

[Printed, 3d.]

A.D. 1857, October 31.—N° 2776.

FRY, JOSEPH.—“An improvement in cementing fabrics when india rubber is employed.” This consists of “means of combining vulcanized india rubber with fabrics containing or composed of wool, silk, or animal fibre, which, if subjected to the ordinary process of heat for vulcanizing india rubber, would be injured or destroyed.” “India-rubber solution or preparation, together with the requisite sulphur or matters containing sulphur, is spread or applied, as heretofore, on the fabric of cotton or other like fibre. Coating of ordinary solution of india rubber or gutta percha is then applied over the sulphurized coating, and a second fabric of cotton or other like fabric, impregnated with gum or other matter which can be readily dissolved, is placed on and combined with the india-rubber coated fabric, and the two together are subjected to the process of heat necessary to produce the change, after which the fabric charged with gum is to be removed.” “Where it is desired to have a coating of vulcanized india rubber to a fabric of silk, wool, or animal fibre, then both the cotton or other fabrics used are to be impregnated with gum or matter which can be readily dissolved, so that when one of the surfaces of the vulcanized india rubber has been caused to adhere to the fabric of silk, wool, or animal fibre, the second fabric of cotton or other fibre may be removed.” “In like manner any number of plies or thicknesses of fabrics may be combined.”

[Printed, 3d.]

A.D. 1857, November 5.—N° 2806.

SIMPSON, GODWIN RATLER, and SIMPSON, DAVID CALDOW.—“Improvements in spring blinds.” These are, first, “Using an india-rubber band or cord, which is made fast on one end of the top lath, &c. that supports the roller. This india-rubber band or cord is carried about one half the length of the framework, and to which is fastened a piece of catgut or cord sufficient to reach the other end of the framework. The end of this piece of catgut or cord is then brought over a wheel through the framework, and is attached to a barrel that is fastened on one end of the roller.” Second, “as to the Venetian blind, using a roller instead of small pulley wheels at present in use. The roller is fixed to the top lath or frame; there are two or

658 INDIA RUBBER AND GUTTA PERCHA :

" three lines pass down the blind, and are made fast to the roller."

[Printed, 3d.]

A.D. 1857, November 7.—N<sup>o</sup> 2825.

WILSON, WILLIAM, and FIELD, JAMES JOHN JOSEPH.—  
" Improvements in casting or moulding liquefied and other substances." " Drawing or otherwise forcing, by means of suitable apparatus, the materials to be moulded into or through certain portions of the apparatus," " and manufacturing candles and other analagous substances by drawing or otherwise forcing, by means of suitable apparatus, the materials to be moulded with certain portions of the apparatus into or through certain other portions of the apparatus." " And manufacturing tablets of soap, night-lights, short candles, and other mouldable substances, by disposing certain self-acting or other moulds, chambers, or receptacles, and using them in such manner that they may become charged with the materials to be moulded, and by drawing or otherwise forcing the said moulds or other receptacle with the materials into or through certain portions of the apparatus." " And, the application to the manufacture of other mouldable substances," " metallic, gutta percha," &c. &c.

[Printed, 4d.]

A.D. 1857, November 10.—N<sup>o</sup> 2836.

DEVON, WILLIAM.—" An improved self-acting apparatus for flushing waterclosets, and the means of connecting the same to water mains, parts of which are applicable to the junction of gas or water pipes generally."

In carrying out the above, apparatus is described for which several claims are made, one being " the application of vulcanized india rubber as a flexible joint in connexion with the pieces of metal piping or tubing forming the syphons," which are in the service box supplied by water from the main, and are passed through floats, the joints enabling these syphons with their floats to rise and fall as required."

[Printed, 10d.]

A.D. 1857, November 17.—N<sup>o</sup> 2881.

PIDDING, WILLIAM.—" Improved manufactures, and improvements in the manufacture of piled fabrics, or of mosaic or



“ tessellated textile and other fabrics, and improvements in some  
 “ of the machinery or apparatus necessary to produce them; also  
 “ the application of certain existing or known machinery or appa-  
 “ ratus for their production.” “ Saturate and rather thickly coat,  
 “ or surround in other ways, threads or yarns with gelatine, gum,  
 “ gutta percha, caoutchouc, pigment, rosin, wax, bitumen, pitch,  
 “ asphalte, tallow, drying oil, sugar, and skins of animals, or such  
 “ parts thereof as are soluble,” &c., “ either separately or com-  
 “ bined, and dry them, lay them side by side longitudinally, and  
 “ set them to pattern for mosaic fabrics, when required;” “ com-  
 “ press them, and in some cases apply heat, and continue such  
 “ operations until they are adhered together side by side.” “ Push  
 “ or force the exposed ends of the threads or yarns to any required  
 “ distance;” “ cut off a slice of the connected threads even with  
 “ the end of the apparatus, and repeat such operations until there  
 “ remain no more connected threads to be cut into slices, and such  
 “ slices are then the complete fabric.” “ In finishing some of  
 “ these fabrics,” a pile is produced on one or both sides by dis-  
 “ solving off any desired thickness of the cement.” “ Another  
 “ fabric, allowing perspiration to exude,” is made as follows :—  
 “ Saturate threads or yarns, say with a solution of gelatine, and  
 “ when dry surround or cover such threads or yarns with a solu-  
 “ tion of caoutchouc, gutta percha, or compound, or either,” &c.;  
 dry, set, compress, &c., and cut veneers or slices. Then discharge  
 from the threads the gelatine “ in such a solvent as will, with or  
 “ without the application of heat, dissolve it without dissolving  
 “ the india rubber, gutta percha, &c.” “ Another mosaic textile  
 “ fabric is formed by adhering together superficially one or two of  
 “ the surfaces of any two of the foregoing fabrics,” &c., &c.  
 Fabrics are made by coating, in a somewhat similar manner,  
 “ spun glass, wires,” &c., and “ vitrifying the mass, after which  
 “ it is cut into veneers.”

[Printed, 3s. 2d.]

A.D. 1857, December 8.—N° 3041.

BROOMAN, RICHARD ARCHIBALD (*a communication from P. J. Guyet*).—“ Improvements in cocks and valves for regulating the  
 “ flow of fluids.” These are :—First, “ the construction of cocks  
 “ and valves for regulating the flow of fluids by the employ-  
 “ ment of a block or blocks of vulcanized caoutchouc, of the kind

660 INDIA RUBBER AND GUTTA PERCHA:

called in France 'Alcalin,' through or between which a plate or " flat valve is caused to slide by means of levers, screws, and nuts, " or otherwise." Second, " the employment of the aforesaid " 'Alcalin' caoutchouc for the seats of valves generally." Third, " several methods of constructing cocks and valves with valve " seats of 'Alcalin' caoutchouc."

[Printed, 7d.]

A.D. 1857, December 11.—N° 3055.

TANTON, JOSEPH.—"Improvements in shepherds' crooks."—*This invention did not proceed to the Great Seal.*—It consists in " connecting the crook to the staff or handle by means of a short " thick piece of india-rubber."

[Printed, 3d.]

A.D. 1857, December 12.—N° 3062.

WALTON, FREDERICK.—"Improvements in the manufacture of " rollers used in machinery for preparing and spinning fibrous mate- " rials, and for other purposes where elastic pressure is required ; " also in the machinery employed in the manufacture of the said " rollers." These are, covering " a metal or other spindle or axis " with vulcanized india rubber or other suitable elastic material, " and in covering the elastic material either with a thin metal tube " or winding a coil of sheet metal or wire over the elastic mate- " rial." The improvements in machinery consist " in the applica- " tion of a pointer to a roller or guide spindle, around which wire " is coiled, which pointer and guide spindle assist in coiling the " wire on the elastic material forming part of the improved roller ; " the wire is kept at a uniform tension by a weighted finger."

[Printed, 7d.]

A.D. 1857, December 17.—N° 3097.

BLIZZARD, WILLIAM.—"Improvements in the treatment of " india rubber, by a new process, for the manufacture of a chrys- " taline and colourless varnish for waterproofing all kinds of " textile fabrics and papers without smell, and without in any " degree altering their appearance; and for making divers var- " nishes and paints."—*This invention did not proceed to the Great*

*Seal*.—It consists in dissolving india rubber or caoutchouc in a resinous spirit, such as naphtha, “which solution may be further decolorized, if required,” and applied as above.

[Printed, 3*d*.]

A.D. 1857, December 18.—N° 3112.

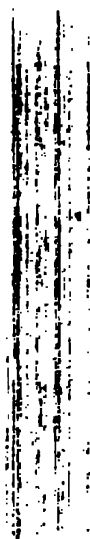
WINSLOW, CHARLES.—“An improvement in the manufacture of elastic gore cloth.” This consists, “not only of a fabric composed of a cement of india rubber or gutta percha and two pieces of cloth, in which the warp and weft of each piece are made to cross one another diagonally or at acute angles, but with the edges of the cloth cut and overlapped, and cemented down in a line or lines out of parallelism with either the warp or weft threads, the line of maximum elasticity in the winding making that angle with the warp as well as the weft, which is the complement of half the angle which they make with each other.”

[Printed, 6*d*.]

A.D. 1857, December 24.—N° 3161.

BURLEY, GEORGE.—“Improvements in apparatus for cutting the pile of fustians and other pile fabrics.” Of these improvements, of which there are several, one is said to be “using vulcanized india rubber, or such like elastic means, to which to attach the separate supports of the respective knives in such manner that, by the extension of such means, an uniform separation of the respective supports may be effected, and a consequent variation in the distance apart of the respective knives given.”

[Printed, 1*s*. 5*d*.]



## INDEX OF SUBJECT MATTER.

[The numbers refer to the page in which the Specification containing the subject commences.]

### Accidents :

Preventing;  
*See* Signaling.

### Accoutrements :

Brady, 182.  
Poole (*Goodyear*), 197, 202.  
Jacquot, 530.  
Hoffstaedt and Blackwell, 548.  
Addison and Sinclair, 556.  
Johnson, 559.

### Aerated Liquids :

Drawing off;  
Fontainemoreau, 461.  
Stopping;  
Taylor, 388.  
Fontainemoreau, 461.

### Aerated Waters :

Filling;  
Mondollot, 300.  
Producing;  
Fontainemoreau, 478.

### Aeriform Bodies :

Stopping;  
Bain and Heywood, 612.

### Aerostatic

Machinery;  
Pellen, 619.

### Agricultural

Machinery;  
Johnson, 536.

### Air :

Holder;  
Adams, 171.  
Keeping out;  
Helbronner, 161.

### Air—*cont.*

Pervious to;  
Bessemer, 327.  
Proofing;  
*See* Coating.  
Supplying;  
Bowra, 350.

### Alcalin :

Brooman (*Guyot*), 659.

### Aluminium :

Use of;  
Truman, 585.  
Taylor, 642.

### Amalgamating :

Tindall and Trotter, 421.

### Amalgams :

Combining with;  
Ellis, 629.

### Animal Substances :

Mixing with;  
De Breza, 48.  
Marshall, 67.  
Cornides, 509.  
Green, 610.  
Hughes, 627.  
Spill, 650.

### Antigropelos :

Parker and Dicks, 261.

### Apartments :

Air, &c. into;  
Helbronner, 161.

### Apron :

Nursing;  
Ewing, 609.

**Armlets :**

Baylis, 205.

**Arts :**Pine;  
Marshall, 67.**Asphalt :**Mode of mixing, &c.  
Hancock, T., 69.  
Goodyear, 616.**Atmospheric Post :**

Bellford, 426.

**Axles :**

Longbottom, 236.

**Bags :**Shaw, 195.  
Knuth, 368.  
White, 413.  
Goodyear, 620.  
Macintosh, 639.**Bait :**For fish;  
Bainbridge, 227.**Balls :**Hancock, C., 129.  
Smith and Phillips, 540.**Ballast :**Supplying;  
Bouza, 350.**Balsams :**Mixing with;  
Duncan, 301.**Bandages :**

Perry, 101.

**Bands :**Siever, 30.  
Perry and Daft, 81.  
Alsop and Foster, 78.  
Hancock, C., 92.  
Wharton, 95.  
Perry, 101.  
Newton, 105.  
Daft, 110.  
Walker, 128.  
Clarkson, 137.  
Burke, 142.  
Haines, 147.  
Dixon and Dobson, 188.  
Wilkinson, 279.**Bands—cont.**Nickels, C., and Selby, 308.  
Wilkinson, 375.  
Wright and Ashbury, 387.  
Waithman, 402.  
Edwards, 419.  
Lucevilliard, 452.  
Bellford, 454.  
Ingall, 491.  
Goodyear, 573.  
Rowley, 578.  
Housfield, 613.  
Riant, 625.**Barrels :**

Hancock, W., 576.

**Basins :**Poole (*Goodyear*), 202.  
Johnson, 559.**Baths :**Poole (*Goodyear*), 202.  
Barton, 279.  
Skertchly, 328.  
Harlow, 331.  
Paine and Ryan, 546.**Batteries :**Floating;  
Grahame, 582.  
Galvanic;  
Watson and Slater, 231.  
Henley, 236.  
Murdoch, 248.  
Allan, 273.  
Fuller, 303.  
Fontainemoreau, 361.  
Meinig, 377.  
Dering, 386.  
Weare, 447.  
Archereau, 451.  
Reid, 519.  
Dering, 609.  
Pulvermacher, 652.**Bacons :**

Sherringham, 259.

**Beaters :**Robinson, 95.  
Koch, 630.**Beds :**Clark, 11.  
Brown, 206.  
Goodyear, 343.  
Holbeche, 438.  
Daft, 542.  
Lewis and Gurney, 550.  
Milner, 585.  
Hoopers, 596.  
Macintosh, 639.

**Bedsteads :**

Poole (*Goodyear*), 207.  
Holbeche, 438.

**Belts :**

Wilkinson, 375.  
Waithman, 402.  
Lucevilliard, 452.  
Bain and Heywood, 612.

**Bituminous Substances :**

Improving ;  
Dundonald, 234, 282.

**Blankets :**

Hancock, C., 47.  
Leese, junr., 53.  
Dalton, 144.  
Kay, 506.

**Blasting**

Rocks ;  
Liebhaber, 164.

**Bleaching :**

Johnson, 6.

**Blinds :**

Tylor, 82.  
Soward, 122.  
D'Homme, 250.  
Russell, 317.  
Barker, 323.  
Kimberly, 359.  
Johnson, 559.  
White and Bull, 653.  
Simpson's, 657.

**Blocks :**

Circular ;  
Brooman (*Perroncel*), 334.  
Printing ;  
Hancock, C., 47.  
Leese, junr., 58.  
Hancock, C., 98.  
Stather, 290.  
Newton, 367.  
Crossley, 512.

**Blood :**

Products ;  
Pillaus, 535.

**Blowing :**

Machines ;  
Vauthier, 518.

**Boats :**

Light, 115.  
Payne, 145.  
Foster, 146.  
Roberts, 187.  
Barton, 279.  
Murton, 563.  
Goodyear, 574.  
Newton, 637.  
Brooman, 656.  
Moving ;  
Liddell, 466.

**Bobbins :**

Renfrew, 510.  
Johnson, 559-563.  
Butcher and Newey, 579.  
Johnson (*Wacrenier*), 586, 588.

**Boilers. See Steam Boilers.**

**Bolster :**

Air ;  
Clark, 11.

**Bolts :**

Coutts, 637.

**Bolusses :**

Cox, 458.

**Bonnets :**

Hinks and Vero, 167.  
Clarkson, 289.  
Spill, 650.

**Bookbinding :**

Hancock, Wm., 41.  
Nickels, C., 84.  
Bingley, 108.  
Beesmer, 176.  
Poole (*Goodyear*), 200.  
Sy, 278.  
Johnson, 559.  
Lenillet, 638.

**Book-marker :**

Stidolph, 476.

**Books :**

Dowse, 109.  
Hughes, 358.  
Willson, 413.  
Ebert and Levisohn, 530.

**Boots :—**

Sylvanus, 2.  
Peal, 5.  
Walker and Alphey, 8.  
Hancock, T., 15, 20, 30.  
Dowie, 44.  
Keene, 85.  
Wright, 102.

**Boots—*cont.***

Fisher, 120.  
 Lorimier, 128.  
 Clark, 133.  
 Burke, 142.  
 Newton, 156.  
 Webley, 170.  
 Bernard, 180.  
 Poole, 191.  
 Bernard, 193.  
 Stobl, 226.  
 Parker and Dicks, 261.  
 Dulaurier, 270.  
 Edgar, 271.  
 Pidding, 279.  
 Bernard, 293.  
 Day, 303.  
 Newton, 322.  
 Duncan, 343.  
 Forster, 347.  
 Scott, 357.  
 Goodyear, 396.  
 Grace and Jones, 419.  
 Cortin, 439.  
 Bellford, 454.  
 Scott, 458.  
 Cooke, 473.  
 Stocker, 507.  
 Pape, 513.  
 Mason and Beeby, 515.  
 Pidding, 539.  
 Martin and Hyams, 539.  
 Hodges, 546.  
 Kennedy, 547.  
 Bousefield, 570.  
 Pidding, 571.  
 Clark's, 579.  
 Hubbard, 582.  
 Goodyear, 587.  
 Hibling, 587.  
 Rice, 588.  
 Ritchie, 615.  
 Brooman (*Gaillard*), 623.  
 Founobert, 624.  
 Goodyear, 635.  
 Grundy, 639.  
 Turner, 640.  
 Newton, 642.  
 Codet-Negrier, 643.  
 Bunn, 647.  
 McKinley and Walker, 648.  
 King, 651.  
 Scott, 652.  
 De Clippéle, 656.  
 Of horses;  
   Rotch, 28.  
   Pidding, 279.

**Boring :**

Newton, 399.  
 Mather, 518.

**Bosses :**

Duncan, 174.  
 Tatham and Cheetham, 212.

**Bottles :**

**Making ;**  
   Bewley, 88.  
   Beltsung, 185.  
   Graham, 224.  
   Johnson, 559.  
   Ingila, 599.  
**Stopping ;**  
   Berry, 23.  
   Hancock, C., 76.  
   Duncan, 262.  
   Scott, 268.  
   Ash, 273.  
   Mellish, 274.  
   Taylor, 388.  
   Stocker, 482.  
   Crapelet, 553.

**Bottling :**

Browne, 317.

**Bowls :**

Dalton, 429.

**Boxes :**

Poole (*Goodyear*), 202.  
 Stocker, 482.  
 Johnson, 559.

**Braces :**

Dowse, 109.

**Braids :**

Bedells, Nickels', C. Turner, 60.

**Brass :**

**Forming ;**  
   Watson, 426.  
**Planishing ;**  
   Watson, 426.

**Breaks :**

Walmesley and Critchley, 290.  
 Chalmers, 395.

**Bricks :**

Pidding, 176.  
 Porter, 376.  
 Jackson, 408.  
 Blashfield, 477.

**Bristles :**

Substitutes for ;  
 Goodyear, 341.

**Bromide :**

**Of arsenic ;**  
   Duvivier, 526.  
**Of boron ;**  
   Duvivier, 526.  
**Of phosphorous ;**  
   Duvivier, 526.  
**Of silica ;**  
   Duvivier, 526.  
**Of sulphur ;**  
   Duvivier, 526.



## Bromine :

Vapour of;  
Parkes, 97.

## Brooms :

Montzani, 474, 513.

## Brushes :

Hancock, W., jun., 60. 62.  
Hancock, C., 127.  
Clough, 192.  
Gosnell's, 235.  
Watson, 252.  
Haigh, 301.  
Goodyear, 341.  
Duncan, 343.  
Johnson (*Guibal*), 397.  
Monzani, 474.  
Griffiths, 496.  
Monzani, 513.  
Johnson, 559.  
Walton, 622.

## Buckets :

Poole (*Goodyear*), 202.  
Paine and Ryan, 546.  
Clarke, 649.

## Buffers :

Fuller, 89.  
De Bergue, 117, 125.  
Haines, 147.  
De Bergue, 153.  
Dixon and Dobson, 188.  
Coleman, 190.  
Asbury, 271.  
Racster, 389.  
Bridges, 430.  
De Bergue, 441.  
Radcliffe, 463.  
Livsey and Weild, 533.  
Haley, 586.  
Richardson, 589.  
Myers, 594.  
Corbitt and Shaw, 601.  
Eaton, 624.

## Building :

Materials;  
Austin, 65.  
Pidding, 176.  
Tizard, 355.  
Pidding, 571.  
Roofs of;  
Brockedon, 77.

## Buildings :

Fireproof;  
Lecompt, 58.  
Fox, 72.  
From damp;  
Fanshawe, 61.  
Drake, 66.

## Buoys :

Holdsworth, 104.  
Light, 115.

## Buoys—*conf.*

Davis, 206.  
Sherringham, 259.  
Paine and Ryan, 546.  
Newton, 637.

## Busts :

Brooman, 79.

## Buttons :

Newton, 152.  
Newton (*Goodyear*), 166.  
Allport, 208.  
Cox, 423.  
Smith, 515.  
Moseley, 549.  
Nicholls, B. 562.  
Job and Tomlinson, 579.  
Chatwins, 598.

## Cables :

Brooman, 268.  
Electric telegraph;  
Statham, 583, 596.  
Macintosh, 655.

## Candle-holders :

Cockings and Potts, 583.

## Candle lamps :

Perry, 101.  
Ogilvie, 238.

## Canisters :

Gilbert, 315.

## Canteens :

Paine and Ryan, 546.

## Cannon :

Wolf, 13.  
Johnson (*Knevit*), 446.  
Bentley, 459.  
Adams, 524.  
Livsey and Weild, 533.  
Crapelet, 558.  
Church, 589.

## Caps :

Weise, 20.  
Sievier, 35.  
Brooman, 81.  
Brockedon and Hancock, T., 106.  
Dowse, 109.  
Walker, 128.  
Hucks and Varo, 167.  
Houghton, 246.  
Clarkson, 269.  
Dulaurier, 270.  
Redgrave, 400.  
Jacquot, 530.  
Spill, 650.  
Of bottles;  
Beltzung, 185.  
Stocker, 462.  
Percussion;  
Richards, 182.  
Horrocks, 324.

**Capsules :**

- Fixing, &c. ;
- Archer, 300.
- Jacob, 310.
- Betjemann, 372.
- Acher, 374.
- Fontainemoreau, 481.
- Making ;
- Jacob, 310.

**Carbonic-acid Gas :**

- Generating, &c. ;
- Taylor, 361.

**Cards :**

- For wool, &c. ;
- Walton, 32.
- Hancock, 92.
- Platt and Palmer, 116.
- Mackenzie, 130.
- Kurtz, 138.
- Mason and Collier, 141.
- Lister, 282.
- Kershaw and Taylor, 497.
- Johnson, 563.
- Job and Tomlinson, 579.
- Horsfall, 619.
- Morphet, 623.
- Walmsley and Howard, 652.

**Carriage**

- Furniture ;
- Poolc (*Goodyear*), 204.

**Carriages :**

- Propelling ;
- Spiller, 471.
- Railway, &c. ;
- Fuller, 89.
- Do Bergue, 123, 135.
- Spencer, 181.
- Hodge, 181.
- Davis, 204.
- Longbottom, 236.
- Burch, 255.
- Wilson, 256.
- Asbury, 271.
- De Bergue, 291.
- Davis, 335.
- Thomas, 379.
- Raeater, 389.
- Raymond, 422.
- Scott, 550.
- Maneglia, 544.
- Clewe, 550.
- Goodyear, 574.
- Hooper's, 596.
- Scott, 604.
- Brooman, 616.
- Knapton, 664.
- Velocity of ;
- Alliott, 141.
- Seats of ;
- Davy, 44.

**Carton Pierre :**

- Substitute for ;
- Clarke, 349.

**Carts :**

- Davis, 204.
- Bird and Welch, 230.
- James, 405.

**Cartridges :**

- Livsey and Weild, 533.
- Bursill, 540.
- Hawker's, 589.

**Carving :**

- Woodcock, 380.

**Cases :**

- Piggott, 123.
- Foster, 146.
- Poolc (*Goodyear*), 202.
- Taylor, 352.
- Shipley, 478.
- Ebert and Levisohn, 530.
- Shipley, 535.
- Bursell, 540.
- Addison and Sinclair, 556.
- Johnson, 559.

**Caseum :**

- Duncan, 301.

**Casks :**

- Making, &c. ;
- Burton's, 289.
- Austin, 393.
- Brown, 398.
- McGaffin, 480.
- Hancock, W., 576.
- Coutts, 637.

**Casting :**

- Johnson, 558.

**Castings :**

- Kerr, 56.

**Casts :**

- Brooman, 79.

**Ceilings :**

- Fox, 72.
- Riddle, 264.

**Cements :**

- Making and using ;
- Kerr, 56.
- Freeman, 58.
- Austin, 65.
- Brooman, 79.
- Clark, 84.
- Hancock, C., 98.
- Payne, 145.
- Haines, 145.
- Newton, 159.
- Duncan, 301.

**Cements—*cont.***

Kestell, 453.  
Ogry, 494.  
Yeadon and Chapman, 615.  
Sorel, 645.  
Parker, 651.  
Fry, 657.

**Cesspools :**

Bell, 161.

**Chaff-cutting**

Machines ;  
Nyc, 648.

**Chains :**

Johnson, 559.

**Chairs :**

Brown, 206.  
Poole (*Hoolyear*), 207.  
Holbeche, 435.

**Chenilles :**

Hughes and Denham, 234.

**Chimnies :**

Sweeping, &c. ;  
Durant, 580.

**China :**

Manufacturing ;  
Blashfield, 477.

**Chlorides :**

Of arsenic ;  
Duvivier, 526.  
Of boron ;  
Duvivier, 526.  
Of phosphorous ;  
Duvivier, 526.  
Of silica ;  
Duvivier, 526.  
Of sulphur ;  
Parkes, 97.  
Duvivier, 526.  
Parkes, 584.

**Cigar Cases :**

Manufacturing ;  
Knuth, 368.  
Beauché, 603.

**Cisterns :**

McGaffin, 480.

**Clamminess :**

Removing ;  
Hancock T., 60.

**Cleaning :**

Knives, &c. ;  
Terrett, 525.  
Job and Tomlinson, 579.  
Deplanque, 633.  
Clocks ;  
Perry, 101.

**Clogs :**

Hancock, T., 15.  
Clark, 133.  
Newton, 156.  
Poole, 191.  
Walker, 231.  
Bernard, 293.  
Stocker, 507.  
Goodyear, 635.  
Grundy, 639.

**Cloth :**

Artificial ;  
Johnson (*Guibal*), 397.  
Cellular ;  
Newton, 157.  
Dressing ;  
Newton (*Nos d'Argence*), 589.  
Gore ;  
Winslow, 661.  
Tracing ;  
Die, 464.

**Coal :**

Cleansing ;  
Lumb, 219.

**Coating :**

Iron, &c. ;  
Robinson, 425.  
Parker, 651.  
Waterproof ;  
Wolfen, 1.  
Eyles, Mowate, and Wallis, 1.  
Sutton, 1.  
Sylvanus, 2.  
Wylde, 2.  
Wheeler, 3.  
Ehnsley, 3.  
Hunclass, 3.  
Peal, 5.  
Bellamy, 5.  
Johnson, 6.  
Parish, 7.  
Hitchcock, 7.  
Ackerman and Cuttican, 8.  
Walker and Alphey, 8.  
Duke and Jacks, 9.  
Simmonds, 9.  
Mollersten, 9.  
Hance, 10.  
Clark, 11.  
Baynham, 12.  
Benjamin, 13.  
Pritchard and Franks, 14.  
Mills and Fairbairn, 17.  
Macintosh, 18.

Coating—*cont.*

Fleetwood, 19.  
 Weise, 19.  
 Hancock, T., 21, 22.  
 Morrison, 24.  
 Blades, 25.  
 Wetterstedt, 26.  
 Hall, 27.  
 Hancock, T., 29.  
 Desgrand, 31.  
 Edmonds, 33.  
 Potter, 34.  
 Hellewell, 34.  
 Sievier, 35.  
 Hancock, T., 42, 45.  
 Bethell, 51.  
 Raper, 52, 53.  
 Varicas, 54.  
 Hall, 54.  
 Kerr, 56.  
 Varicas, 56.  
 Keene, 56.  
 Newbery, 57.  
 Fanshawe, 61.  
 Wetzelar, 62.  
 Hancock, C. 63.  
 Hancock, W., 63.  
 Hancock, T. 69.  
 Wright, 70.  
 Foster, 74.  
 Townsend, 75.  
 Bossy, 87.  
 Williams, 87.  
 Kloet, 95.  
 Wright, 102.  
 Newton, 105.  
 Brockedon and Hancock, T., 106.  
 Light, 115.  
 Forster, 117, 120.  
 Hutchison, 122.  
 Jacobs, 133.  
 Brindley, 139.  
 Burke, 142.  
 Haines, 145.  
 Radley and Meyer, 155.  
 Jennings, 160.  
 Menotti, 164.  
 Hinks and Vero, 167.  
 Stones, 169.  
 Webley, 170.  
 Newton, 170.  
 Bessemer, 176.  
 Froggart, 178.  
 Lemoine, 191.  
 Bernard, 193.  
 Davis, 206.  
 Bell, 206.  
 Blair, 212.  
 Tyler, 213.  
 Stoll, 226.  
 Ayckbourn, 254, 328.  
 Assanti, 434.  
 Stoncham, 495.  
 Fontainemoreau, 497.  
 Stocker, 507.  
 Cornides, 509.

Coating—*cont.*

Perry, 513.  
 Bimmel (*Magen*), 521.  
 Cornides, 532.  
 Fanshawe, 535.  
 Hill, 551.  
 Friend, 553.  
 Cornides, 553.  
 Johnson, 559.  
 Sorel, 568.  
 Statham, 583.  
 Tomlinson, 585.  
 Green, 610.  
 Blackwood, 625.  
 Juvin, 631.  
 Spill, 650.  
 Burton, 653.  
 Macintosh, 655.  
 Fry, 657.  
 Pidding, 659.

## Cocks :

Jennings, 124.  
 Roe, 197.  
 Gray, 198.  
 Derrington and Chadwick 250.  
 Wilkinson, 257.  
 Rider, 292.  
 Wilks, 302.  
 Bird, 417.  
 Rickard, 418.  
 Galloway, 443.  
 Kraut, 470.  
 Lund, 498.  
 Smith and Phillips, 540.  
 Death and Popplewell, 541.  
 Stones, 556.  
 Coffin, 566.  
 Sheppard, 593.  
 Bestwick and Berry, 596.  
 Derbyshire, 612.  
 Brooman (*Guyet*) 659.

## Cocoa Nut

Shells :  
 Godefroy, 568.

## Coffin

Furniture :  
 Humpage, 283.

## Coffins :

Johnson (*Deselle*), 356.

## Colours :

Mixing with, &c. :  
 Fleetwood, 19.  
 Hancock, T. 29.  
 Edmonds, 33.  
 Hancock, T., 43, 45.  
 Hancock, C., 47.  
 Keene, 56.  
 Hancock, C., 63.  
 Brooman, 79.

Colours—*cont.*

Hancock, C., 98.  
 Brockedon and Hancock, 106.  
 Forster, 117, 120.  
 Hancock, T., and Phillips, 123.  
 Hancock, C., 127.  
 Burke, 142.  
 Payne, 145.  
 Hinks and Vero, 167.  
 Newton (*Goodyear*), 168.  
 Bunn, 173.  
 Lemoine, 191.  
 Gaullie, 191.  
 Poole (*Goodyear*), 197.  
 Macintosh, 207.  
 Mackenzie and Blair, 209.  
 D'Homme, 250.  
 Humpage, 283.  
 Berry and Booth, 306.  
 Scuttetten, 315.  
 Green, 321.  
 Brooks, 325.  
 Brooman, 332, 354.  
 Bury and Green, 369.  
 Johnson (*C. E. F. Guibal*), 397.  
 Newton, 463.  
 Guichard, 481.  
 Newton, 561.  
 Gidley and Christopher, 605.  
 Sorel, 645.

## Colouring :

With flock :  
 McIntosh, 83.

## Collodion :

Coating ;  
 Cornides, 532.  
 Audemars, 542.  
 Parkes, 584.

## Combs :

Hair :  
 Hancock, W., jun., 62.  
 Poole (*Goodyear*), 194.  
 Johnson (*Guibal*), 397.  
 Bernard, 504.  
 Johnson, 559.  
 Goodyear, 573.

## Condensers :

Poole, 393, 511.  
 Craddock, 634.

## Cop Tubes :

Marland, 640.

## Copper :

Forming ;  
 Watson, 426.

## Cords :

Perry, 101.  
 Wilkinson, 279.

## Cork :

Combining with ;  
 Clarkson, 137.

## Corking :

Blain, 242.

## Corks :

Berry, 23.  
 Hancock, C., 76.  
 Cutting ;  
 Chamberlain, 650.

## Corn :

Reaping ;  
 Brinsmead, 265.  
 Cornides, 553.  
 Johnson, 559.  
 Sorel, 568.

## Corrosive fluids :

Holding, &c. ;  
 Johnson, 559.  
 Brooman, 570.

## Corsets :

Smith, 229.  
 Garnett, 639.

## Couches :

Perry, 101.

## Covering

Bodies  
 Fanshawe, 61.  
 Santelet, 578.  
 Job and Tomlinson, 579.

## Covers :

Brookes, 321.

## Creosote :

Harrison, C. W., and J. J., 221.

## Crooks :

Shepherds' ;  
 Tanton, 660.

## Crushing

Ors, &c. ;  
 Tendall and Trotter, 421.

## Curtains :

D'Homme, 250.  
 Kimberley, 359.

**Curtains—cont.**

Waterproof;  
Tylor, 82.

**Currycombs :**

Pitman, 642.

**Cushions :**

Air;  
Clark, 11.

**Cuttings :**

Of caoutchouc, &c.;  
*See Waste.*

**Cylinders :**

*See Rollers, Printing, &c.*

**Decay :**

Preserving from;  
Mollersten, 9.  
Benjamin, 13.  
De Breza, 48.  
Parkes, 66.  
Wright, 70.  
Fife, 263.  
Bethell, 283.  
Assanti, 434.

**Deodorizing :**

Hancock, C., 98.  
Varroc, 360.  
Fry, 393.  
Hill, 551.  
Metcalf, 617.  
Blizzard, 660.

**Designs :**

Enlarging;  
Murdoch, 548.  
Producing, &c.;  
Brooman, 232.  
Reducing;  
Murdoch, 548.

**Desks :**

Taylor, 352.

**Devulcanizing :**

Parkes, 97.  
Hancock, T., and Phillips, 123.  
Christopher and Gidley, 326.  
Newton, 422.  
Ross, 521.  
Brooman, 538.

**Devulcanizing—cont.**

Penney, 545.  
Ford, 581, 592.  
Dodge, 594.  
Ford, 608, 619.  
Johnson, 620.  
Lorimier, 622, 627.  
*See also Waste.*

**Discharging**

Air, &c.;  
Heywood, 641.

**Distance :**

Measuring, &c.;  
St. Charles, 338.

**Distilling :**

Johnson (*Lemetta's and Bonic*)  
640.

**Doors :**

Perry, 101.  
Milwain, 148.  
Newton, 152.  
Newton (*Goodyear*), 168.  
Lillie, 175.  
Coleman, 190.  
Couchman, 215.  
Kimberley, 359.  
Greenwood, 405.  
Mayer and Kind, 531.

**Doubling :****Drawing :**

Materials;  
Goodyear, 342, 362.

**Drafts :**

Preventing;  
Greenwood, 405.

**Drainage :**

Hall, 103.  
Bell, 161.

**Dress :**

Fastenings of;  
Masters, 126.

**Dressing :**

Markland, 479.

# INDEX OF SUBJECT MATTER.

673

- Drilling :**  
Newton, 300.  
Lewis, 406.
- Drills :**  
Agricultural;  
Spooner, 333.
- Drying :**  
Chabert, 164.  
Green, 610.  
Cowley, 632.
- Dust :**  
Excluding;  
Helbronner, 161.  
Gollop, 604.
- Earthenware :**  
Moulding;  
Brooman (*Serèque*), 626.
- Elastic Fluids :**  
Measuring, &c.;  
Topham, 329.
- Electric Apparatus :**  
Constructing;  
Johnson, 452.
- Electric Currents :**  
Producing;  
Fontainemoreau, 347.  
Pulvermacher, 632.  
Transmitting;  
Le Gras and Gilpin, 229.  
Watson and Slater, 231.  
Watt, 242.
- Electricity :**  
Applying;  
Staite, 288.  
Holmes, 557.  
Producing;  
Fontainemoreau, 361.
- Electric Telegraphs :**  
Constructing;  
Henley, 239.  
Physick, 240, 410.  
Siemens, 436.  
Gilpin, 456.  
Thomson's and Rankine, 529.
- Electrifying**  
Machines;  
Brackenbury, 243.
- Electro Deposits**  
On india rubber;  
Truman, 131.  
Goodyear, 363.  
Drew, 395.
- Electro-magnetic**  
Apparatus;  
Carosio, 284.  
Watson, 415.
- Embossing :**  
Keene, 56.  
Hiebfeld, 91.  
Woodcock, 380.  
Devincenzi, 459.  
Thompson and Barclay, 598.
- Ends :**  
Fastening;  
Hacket, 485.
- Engraving :**  
Woodcock, 380.  
Devincenzi, 459.  
Fontainemoreau, 487.
- Envelopes :**  
Addenbrooke, 179.  
Shaw, 193.
- Etching :**  
Hancock, C., 47.
- Exhausting**  
Apparatus;  
Bouvet, 500.
- Extracting**  
Oils, &c.;  
Johnson (*Lemettais and Boniere*), 640.
- Fabrics :**  
Elastic;  
Hancock, T., 15.  
Sievier, 30.  
Desgrand, 31.  
Sievier, 32, 35, 52.  
Nickels, C., 65.  
Bedella, 73.  
Nickels, C. and B., 73.  
Alsop and Foster, 78.  
Nickels, C., 80.  
Newton, 87.  
Nalder, 104.

**Fabrics—cont.**

- Lutel (*Oudinot*), 109.
- Nickels, C., 115.
- Daft, 116.
- Hancock, T., 121.
- Walker, 128.
- Longdon and Tabberer, 161.
- Newton, 170.
- Nickels, C., Ball, and Bagley, 177.
- Godefroy, 218.
- Fontainemoreau, 240.
- Thornton's, 262.
- Nickels, C., 293.
- Day, 303.
- Carpenter, 316.
- Knuth, 368.
- Bedells, 404.
- Green, 435.
- Lucevillard, 462.
- Turner, 555.
- Bedells, 575.
- Turner, 621.
- Goodyear, 635.
- Turner, 640, 650.
- Finishing;
  - Cochran, 346.
  - Bury and Green, 369.
- Napped or Piled;
  - Robertson, 48.
  - Poole, 49.
  - Hancock, W., junr., 60.
  - Taylor, 89.
  - Nickels, 146.
  - Siever, 166.
  - Crossley, 167.
  - Nickels, C., Ball and Bagley, 177.
  - Thornton's, 262.
  - Pidding, 287, 390, 658.
  - Burley, 661.
- Of continuous length;
  - Clark, 64, 84.
  - Burke, 93.
  - Goodyear, 362.
  - Marié, 517.
  - Green, 610.
- Stretching;
  - Hirst and Mitchell, 284.
  - Bury and Green, 369.
  - Laing, 610.

**Farinaceous Matters :**

- Mixing with;
  - Hinks and Nicolle, 185.

**Fatty Bodies :**

- Substitute for;
  - Sorol, 411.

**Feeding**

- Apparatus;
  - Bussan, 551.

**Fenders**

- Of ships;
  - Davis, 206.

**Ferrules :**

- Aubusson, 468.

**Fibres :**

- Treating;
  - Audemars, 542.
- Mixing with;
  - Hancock, T., 21, 22, 29, 96.
  - Parke, 197.
  - Duncan, 343.
  - Stoneham, 405.
  - Hill, 551.
  - Bousfield, 613.

**Figured**

- Surfaces;
  - Devicenzi, 444, 450.

**Figures :**

- Moore, 139.
- Jeffs, 246.

**File :**

- Elastic;
  - Harris, 25.

**Films :**

- Normandy, 277.

**Filters :**

- Owen, 461.
- Mathieu, 498.

**Filtering**

- Volatile liquids;
  - Robinson, 420.

**Fire :**

- Alarm;
  - Woodley and Swinford, 546.
  - Smith, 584.
- Escape;
  - Bate, 337.
- Extinguishing;
  - Macbay, 225.
  - Smith, 584.
- Proof against;
  - Wyld, 2.
  - Cook, 16.
  - De Bresa, 48.
  - Bethell, 51.
  - Davies, 52.
  - Leconte, 58.
  - De Varroc, 62.
  - Wild, 63.
  - Marshall, 67.
  - Fox, 72.
  - Ruthven, 141.
  - Progart, 178.
  - Macbay, 225.

**Fire-arms :**

- Poole (*Goodyear*), 197, 202.
- Bentley, 246.



**Fire-arms—*cont.***

Wollowitz, 272.  
Winiwarter, 274, 280.  
Phillips, 313.  
Coles, 406.  
Bentley, 459.  
Livesey and Weild, 533.  
Addison and Sinclair, 556.  
Crapelet, 558.  
Church, 580.

**Fire-places :**

Brookes, 322.

**Firewood :**

Substitute for;  
Cassell, 77.

**Fish :**

Breeding, &c.;  
Boccus, 406.

**Fittings :**

For Cases, &c.;  
Taylor, 352.  
Shipley, 478.  
Ebert and Levisohn, 530.  
Shipley, 535.  
Johnson, 559.

**Flax :**

Treating;  
Plummer, 140.  
Egan, 214.  
Ellins, 222.  
Lister, 330.  
Dickson, 392.

**Flies :**

Artificial;  
Bainbridge, 227.  
Huddart, 245.

**Floats :**

Smith and Phillips, 540.  
Newton, 637.  
Coutts, 637.

**Flocking :**

Johnson, 6.  
Sievier, 35.  
Brockedon and Hancock, T., 106.  
Walker, 128.  
Jacobs, 133.  
Burke, 142.  
Bessemer, 176.  
Pidding, 297.  
Wansborough, 401.  
Guichard, 461.  
Hill, 551.  
Sorell, 568.

**Floors :**

Fireproof;  
Wild, 63.  
Fox, 72.

**Floorcloths :**

Galloway, 72.  
Brookes, 325.  
Goodyear, 575.  
Job and Tomlinson, 579.  
Jeune, 604.  
Tayler, 642.

**Flour :**

Dressing;  
Keefe, 524.

**Fluids :**

Conveying;  
Robson, 63.  
Drawing off;  
Robson, 63.  
Stones, 556.  
Forcing;  
Robson, 63.  
Morgan, 291.  
Measuring;  
Taylor, 239.  
Hanson and Chadwick, 295.  
Duncan, 610.  
Preserving;  
Symington, 281.  
Pressure of;  
Alliott, 141.  
Cazalat, 267.  
Smith, 527.  
Raising;  
Robson, 63.  
Morgan, 291.  
Binks, 541.  
Regulating;  
Binks, 541.  
Securing;  
Berry, 23.  
Newton, 637.  
Supplying;  
Browne, 317.

**Fluorides :**

Of arsenic;  
Duvivier, 526.  
Of boron;  
Duvivier, 526.  
Of phosphorous;  
Duvivier, 526.  
Of silica;  
Duvivier, 526.  
Of sulphur;  
Duvivier, 526.

**Forges :**

Waygood, 411.

**Forging :**

Metals, &c.;  
Bentley and Alcock, 644.

**Fringes :**

Hughes and Denham, 234.  
Collier, 436.

**Fuels :**

Artificial;  
Brooman, 79.

**Furnaces :**

Blast;  
Archer, 268.

**Furniture :**

Swinging;  
Brown, 444.

**Gaiters :**

Walker and Alphey, 8.  
Hancock, T., 30.  
Keene, 85.  
Parker, 407.

**Galoche :**

Hancock, T., 30.  
Keene, 85.  
Brockedon and Hancock, T., 127.  
Hancock, C., 127.  
Clark, 131.  
Duncan, 343.  
Stocker, 567.  
Pidding, 539.  
Martin and Hyams, 539.  
Clark's, 579.  
Hibling, 587.

**Garments :**

Nicoll, H. J., 272.  
Nicoll, D., 299.  
Fanshawe, 535.

**Gas :**

Drawing off;  
Jennings, 124.  
Impermeable to;  
Bousfield, 635.  
Measuring;  
Hanson and Chadwick, 295.  
Topham, 329.  
Teague, 566.  
Chadwick and Frost, 640.  
Producing;  
Stones, 150.  
Newton, 158.  
Anderson, 404.  
Producing from india-rubber;  
Mollerat, 34.  
Fontainemoreau, 134.  
Regulating;  
Porteous, 591.  
Stopping;  
Bain and Heywood, 612.

**Gases :**

Impervious to;  
Pellen, 619.  
Bousfield, 635.  
Submitting to;  
Parks, 97.  
Hancock, C., 111.  
Jennings, 124.

**Gases—cont.**

Nickels, C., 134.  
Duncan, 174.  
Johnson (*Lefevre*), 383.  
Holmes, 557.  
Hughes, 627.

**Gasogenes :**

Bellford, 213.  
Fontainemoreau, 473.

**Gasometers :**

Flexible, &c.;  
Caslon, 16.  
Nicholson and Coles, 24.  
Tenneson, 43.  
Hebert, 61.  
Coutts, 657.  
Knapton, 654.

**Gelatin :**

Use of;  
Marshall, 67.  
Brooman, 354.  
Cornides, 509, 553.  
Green, 610.  
Hughes, 627.  
Spill, 650.

**Gimps :**

Hughes and Denham, 234.

**Glass :**

Coating;  
Cornides, 532.  
Painting;  
Roussel, 439.  
Polishing, &c.;  
Hartley, 66.  
Richardson, 646.

**Glazing :**

Kent, 213.  
Kestell, 455.

**Globes :**

Marshall, 67.  
Morison, 434.  
Silbermann, 562, 569.

**Gloves :**

Hancock, T., 15.  
Hancock, W., junr., 60.  
Masters, 86.  
Nalder, 104.  
Thornton's, 202.  
Foulkes, 485.

**Glue :**

Gutta Percha;  
Danne, 644.

**Glueing :**

Austin, 65.

**Gluten :**

Marshall, 67.  
Duncan, 301.

- Goods :**  
 From damp;  
     Fanshawe, 61.  
     Piggott, 125.  
 Weight of;  
     Alliott, 141.
- Gores :**  
     Dowie, 44.
- Graduating**  
     Scales;  
         Mackenzie and Blair, 209.
- Graining :**  
     Hancock, T., 43.  
     Nichol, J., 230.
- Guages :**  
     Vacuum;  
         Parkinson, 649.
- Guilding :**  
     Clark, 11.  
     Keene, 56.  
     Drew, 395.  
     Meers, 424.
- Gums :**  
     Dundonald, 232.  
     Johnson (*Lemettais and Boniere*),  
         640.  
     Of the mouth;  
         Bartlett, 101.  
         Truman, 131.  
         Moseley, 253.  
         Schoofs, 559.  
         Ninck, 632.
- Gum Sponge :**  
     *See* Sponge.
- Guns :**  
     Poole (*Goodyear*), 197.  
     Phillips, 313.  
     Bentley, 459.  
     Livesey and Weild, 533.  
     Krupp, 592.
- Gun-boats :**  
     McLaine, 475.
- Gun Cotton :**  
     Cornides, 553.
- Gunpowder :**  
     Manufacturing;  
         Goodyear, 575.
- Hair :**  
     Curling;  
         Woodward, 337.  
     Trimming;  
         Babb, 317.  
     Washing;  
         Lister, 330, 348.
- Hammers :**  
     Forge;  
         Butcher and Newey, 560.
- Hammock :**  
     Air;  
         Clark, 11.
- Handles :**  
     Of doors;  
         Newton (*Goodyear*), 168.  
         Mayer and Kind, 531.  
         Johnson, 559.  
     Of instruments, &c.;  
         Newton, 152.  
         Newton (*Goodyear*), 168.
- Hangings :**  
     D'Homme, 250.
- Harness :**  
     Hancock, T. 20.  
     Davy, 44.  
     Poole (*Goodyear*), 204.  
     Bowra, 309.  
     Rice, 332.  
     Banner, 391.  
     Lucevilliard, 452.  
     Shearman, 630.  
     Codet-Negrier, 643.  
     Le Jeune (*Brucssaux*), 653.  
     De Clippéle, 650.
- Hat**  
     Protector;  
         Provost, 229.
- Hatbands :**  
     Baylis, 205.  
     Spill, 440.
- Hats :**  
     Sutton, 1.  
     Wheeler, 3.  
     Elmsley, 3.  
     Parrish, 7.  
     Ackerman and Cutteau, 8.  
     Duke and Jacks, 9.  
     Simmonds, 9.  
     Hance, 10.  
     Pritchard and Franks, 14.  
     Hancock, T., 30.  
     Sievier, 35.  
     Brooman, 81.  
     Brockedon and Hancock, T., 106.  
     Dowse, 109.  
     Walker, 123.  
     Clarkson, 137.  
     Hinks and Vero, 167.  
     Tyler, 213.  
     Clarkson, 269.  
     Dulsaurier, 270.  
     Stuart, 443.

**Hats—cont.**

- Brooman, 457.
- Johnson, 500.
- Stocker, 507.
- Johnson (*Chaumont*), 511.
- Fontainemoreau (*Langenhagen*), 528.
- Jacquot, 530.
- Spill, 650.

**Heat :**

- Production of ;
- Carosis, 284.

**Heating :**

- Preliminary ;
- Duncan, 174.
- Rider, 192.
- Gerard, 258.
- Rider, 382, 625.
- Apparatus ;
- Sevan, 140.

**Hides :**

- Combining ;
- Clarkson, 137.

**Hinges :**

- Hale, 105.

**Holes :**

- Stopping ;
- Woodward, 450.
- Varlet, 462.

**Holsters :**

- Addison and Sinclair, 556.

**Horn :**

- Treating ;
- White, 548.

**Horse :**

- Furniture ;
- Poole (*Goodyear*), 204.
- Rice, 332.

**Hose :**

- Bewley, 88.
- Haines, 147.
- Bousfield, 613.

**Houses :**

- Portable ;
- Walker, 241.
- White, 530.
- Covering for ;
- Grahame, 314.
- Constructing ;
- White, 530.
- Lining Walls of ;
- Drake, 66.
- Marshall, 67.

**Human Body :**

- Treating ;
- Holmes, 557.

**Hydraulic Machines :**

- Walker, 114.

**Hydrolaines :**

- Johnson, 6.

**Hyposulphite of Zinc :**

- Manufacturing and applying ;
- Johnson, 230.

**Ignevador :**

- Bate, 337.

**Illuminators :**

- Chappuis, 457.

**Impressions :**

- Brooman, 79.
- Obtaining ;
- Brooman, 354.

**Inkholders :**

- Bertolacci, 223.
- Mill, 446.

**Inkstands :**

- Daft, 110.
- Newton, 152.
- Newton (*Goodyear*), 168.
- Daft, 323.
- Mill, 446.
- Mordan, 471.
- Hancock, J., 500.
- Danks, 504.
- Fontainemoreau, 527.
- Johnson, 559.
- Scully and Heywood, 593.
- Taylor, 642.

**Insects :**

- Prevention, &c. of ;
- Sutton, 1.
- De Breza, 48.
- Kerr, 56.
- Hutchinson, 122.

**Instruments :**

- For Measuring ;
- Mackenzie and Blair, 209.
- Goodyear, 362.
- Webster, 622.
- Nautical ;
- Piggott, 125.
- Poole (*Goodyear*), 198.
- Davis, 267.
- Lilley, 367.
- Aston and Germaine, 469.

**Instruments—cont.**

- Ker, 491.
- Gray, 502.
- Johnson, 559.
- Musical ;
  - Brockedon, 77.
  - Nickels, 90.
  - Piggott, 125.
  - Mackenzie, 130.
  - Poole (*Goodyear*), 207.
  - Johnson, 559.
  - Monckton, 606.
  - Rolfe, 636.
- Mathematical ;
  - Davis, 267.
  - Johnson, 559.
- Medical and Surgical ;
  - Brockedon, 77.
  - Bewley, 88.
  - Hodges and Brockedon, 172.
  - Corvi, 404.
  - Deplanque, 633.
- For holding ;
  - Plummer, 140.
- Optical ;
  - Piggott, 125.
  - Poole (*Goodyear*), 198.
  - Davis, 267.
- Intonaco :
  - Patent ;
    - Marshall, 67.
- Iodide :
  - Of Arsenic ;
    - Duvivier, 526.
  - Of Boron ;
    - Duvivier, 526.
  - Of Phosphorous ;
    - Duvivier, 526.
  - Of Silica ;
    - Duvivier, 526.
  - Of Sulphur ;
    - Duvivier, 526.
- Iodine :
  - Vapour of ;
    - Parkes, 97.
- Irrigators :
  - Bentley, 457.
- Japanning :
  - Newton, 448.
- Jars :
  - Beltzung, 185.
  - Graham, 224.
  - Duncan, 262.
  - Scott, 268.
- Joints :
  - Lacey, 216.
  - Frankham, 325.
  - Moseley, 428.
  - Hodges, 455.
  - Jefferis, 466.

**Joints—cont.**

- Miles, 467.
- Lund, 498.
- Skidmore and Bolton, 506.
- Farjon, 519.
- Chameroy, 520.
- White, 530.
- Miles, 537.
- Mouchel, 554.
- Stocker, 562.
- Pidding, 571.
- Jennings, 590.
- Collins, 598.
- Spencer, 614.
- Harlow, 628.
- Devon, 658.
- Tanton, 660.
- Juice :
  - India-rubber ;
    - Hancock, T., 22, 29, 45.
    - Cassell, 77.
    - Johnson, 281.
    - Newton, 561.
- Jugs :
  - Poole (*Goodyear*), 202.
- Kamptulicon :
  - Bunn, 173.
- Knapsacks :
  - Brady, 318, 335.
  - Lewis and Gurney, 550.
- Kneading :
  - Nickels, C., 299, 311.
- Kneecaps :
  - Rotch, 28.
- Knives :
  - Johnson, 559.
- Lac :
  - Dissolving ;
    - Normandy, 83.
- Ladders :
  - Davis, 335.
- Lamps :
  - Ogilvie, 238.
  - Clarke, 247.
  - Pife, 265.
  - Cockings and Potts,
  - Safety ;
    - Pife, 265.
- Landmarks :
  - Paine and Ryan, 46.
- Layers :
  - Normandy, 277.
- Leakage :
  - Indicating ;
    - Davies (*Shaler*), 607.

**Leakage :**

- Measuring ;
- Davies (*Shaler*), 607.
- Prevention of ;
- Dickinson, 13.
- Browne, 130.

**Leather :**

- Artificial ;
- Hancock, T., 20.
- Cooley, 222.
- Huddart, 263.
- Johnson, 561.
- Green, 610.
- Jenne, 629.
- Codet-Negrier, 643.
- Cementing ;
- Duncan, 301.
- Ogg, 494.
- Changing into ;
- Hitchcock, 7.
- Manufacturing, &c. ;
- Clarkson, 137.
- Webley, 170.
- Whinery, 260.
- Splitting ;
- Stansbury (*Merriam and Crosby*), 578.

**Leather Cloth :**

- India Rubber ;
- Job and Tomlinson, 579.
- Green, 610.

**Letters :**

- Conveying ;
- Newton, 248.
- Manufacturing ;
- Moore, 130.
- Jeff, 246.
- Transmitting ;
- Bellford, 426.

**Legs :**

- Coverings ;
- Mason and Beeby, 515.
- Of horses ;
- Rotch, 28.
- Artificial ;
- Salt, 565.

**Life-boats :**

- Payne, 145.
- Berdan, 531.
- Paine and Ryan, 546.

**Life-rafts :**

- Parratt, 389.

**Light :**

- Diffusing ;
- Chappuis, 437.
- Producing ;
- Carosio, 284.

**Lignum Spagnum :**

- Clarke, 350.

**Links :**

- Coleman, 190.

**Linseed Oil :**

- Preparing ;
- Kloet, 93.

**Litter :**

- Lewis and Gurney, 550.

**Liquids :**

- Aerated ;
- Bellford, 213.
- Glover, 244.
- Villiet, 294.
- Conveying ;
- Robson, 63.
- Drawing off ;
- Robson, 63.
- Jennings, 124.
- Murphy, 255.
- Wilkinson, 257.
- Bain and Heywood, 612.
- Expressing ;
- Needham and Kite, 333.
- Filtering ;
- Wilkinson, 257.
- Robinson, 420.
- Forcing ;
- Robson, 63.
- Morgan, 291.
- Bentley, 457.
- Measuring ;
- Duncan, 262.
- Topham, 329.
- Chadwick and Frost, 640.
- Raising ;
- Robson, 63.
- Lacey, 216.
- Duncan, 262.
- Morgan, 291.
- Bentley, 457.
- Myers, 567.
- Regulating ;
- Topham, 329.
- Brooman (*Guyet*), 659.
- Stopping ;
- Fontainemoreau, 461.
- Bain and Heywood, 612.
- Supplying ;
- Bain and Heywood, 612.

**Liquors :**

- Fermenting ;
- Youil, 507.

**Lives :**

- Preserving ;
- Ruthven, 141.
- Payne, 145.
- Brims, 345.
- Poole, 369.
- Johnson (*D'Houdetot*), 371.
- Thompson, 509.

# INDEX OF SUBJECT MATTER.

681

## Lives—*cont.*

Preserving ;  
 Cortland, 569.  
 Berdan, 531.  
 Paine and Ryan, 546.  
 Hyde, 547.  
 Goodyear, 555.  
 Bain and Heywood, 612.  
 Bunker, 636.  
 Goodyear, 636.

## Locomotive Engines :

Anderson, 296.  
 Clewe, 550.

## Locks :

Perry, 101.  
 Coles, 406.

## Looking-glasses :

Poole (*Goodyear*), 200.  
 Williams, 534.  
 Protecting ;  
 Vouillon, 430.

## Lubricators :

Munkittreck, 143.  
 Deutsch, 255.  
 Johnson, 258.  
 Nickels, E., 290.  
 Defever, 323.  
 Johnson, 595.

## Machinery :

Working ;  
 Palmer, 314.

## Magnetic :

Apparatus ;  
 Johnson, 452.

## Magneto-Electric :

Apparatus ;  
 Shepherd, 334.

## Manometer :

Cazalat, 267.

## Manure :

Ker, 56.  
 Cowley, 632.

## Maps :

Enlarging ;  
 Murdoch, 548.  
 Reducing ;  
 Murdoch, 548.  
 Unwinding, &c. ;  
 Kimberley, 359.  
 White and Bull, 653.

## Marking :

Materials ;  
 Goodyear, 342, 362.

## Marble :

Liebhaver, 164.  
 Brooman, 328, 420.

## Mastic :

Brooman, 79.

## Material :

New ;  
 Newton, 460.  
 Alison, 472.

## Matrasses :

Hooper, 596.  
 Gizard, 601.  
 Reynaud, 631.

## Measures :

Making ;  
 Poole (*Goodyear*), 202.

## Metallic Ornaments :

Fixing ;  
 Rioux, 567.

## Metals :

Casting ;  
 Bernard, 304.  
 Coating ;  
 Dickinson, 13.  
 Russell, 187.  
 Poole (*Goodyear*), 197, 201.  
 Fife, 263.  
 Goodyear, 309.  
 Davis, 396.  
 Ryder's, 435.  
 Parkinson, 640.  
 Coating with ;  
 Clark, 11.  
 Keene, 56.  
 Hancock, C., 92.  
 Burke, 93.  
 Truman, 131.  
 Bessemer, 176.  
 Goodyear, 363.  
 Drow, 395.  
 Meeus, 424, 427.  
 Green and Pickett, 516.  
 Cornides, 553.  
 Sorel, 568.  
 Combining with ;  
 Ellis, 629.

**Metals—cont.**

- Mixing with;
  - Job and Tomlinson, 579.
- Shaping;
  - Stocker, 562.
- Solutions for depositing;
  - Parkes, 66.
- Treating with;
  - Newton (*Goodyear*), 163.
  - Bunn, 173.
  - Goodyear, 309, 573.

**Meters :**

- Gas and water, &c.;
- Tague, 566.

**Millboard :**

- Manufacturing;
  - Harlow, 460.
- Substitute;
  - Childs, 366.

**Milk :**

- Preserving;
  - Symington, 281.

**Milldew :**

- Preventing;
  - Sutton, 1.
  - Whytock, 10.
  - Townend, 75.

**Mills :**

- For grinding;
  - Turner, 366.

**Minerals :**

- Treating;
  - Perkes, 215.

**Moisture :**

- Expressing;
  - Needham and Kite, 339.

**Mortar :**

- Kerr, 56.

**Moths :**

- Prevention of;
  - Sutton, 1.

**Motive Power :**

- Obtaining, &c.;
- Taylor, 239.
- Constable, 269.
- Hanson and Chadwick, 295.
- Dowdman, 353.
- Waller, 463.
- Johnson, 538.
- Duncan, 510.
- Chadwick and Frost, 640.

**Mouldiness :**

- Prevention of;
  - Whytock, 10.

**Moulding :**

- Hancock, T., 45.
- Foster, 74.
- Bewley, 88.
- Bielefeld, 91.
- Hancock, T., 98.
- Hancock, C., 98.
- Brookedon and Hancock, T.
- Hancock, C., 118, 127, 129.
- Payne, 145.
- Hunt, 158.
- Hinks and Nicolle, 185.
- Newton, 186.
- Gaullie, 191.
- Poole (*Goodyear*), 198, 199, 202.
- Bernard, 304.
- Valls, 331.
- Porter, 376.
- Jackson, 408.
- Newton, 463.
- Johnson, 499.
- Wall, 502.
- Ross, 521.
- Goodyear, 552.
- Johnson, 558.
- Silbermann, 569.
- Goodyear, 573.
- Brooman (*Senèque*), 626.
- Lorimier, 627.
- Johnson (*Morey*), 634.
- Hendry and R. H. Handcock
- McKinley and Walker, 648.
- Wilson and Field, 658.

**Mouldings :**

- Kerr, 56.
- Marshall, 67.
- Bielefeld, 91.
- Forty and Haynes, 440.
- Hitching and Balby, 466.

**Moulds :**

- For candles;
  - Kendall, 238.
  - Wilson and Austen, 351.
  - Wilson and Field, 658.

**Moustache :**

- Stocker, 507.

**Music :**

- Turning over, &c.;
- Ager, 339.

**Music Books :**

- Willson, 413.

**Muslin :**

- Finishing;
  - Cochran, 346.



**Nap :**

On waterproof cloth ;  
Weise, 19.  
Sievier, 35.

**Nails :**

Rowley, 226.

**Nosebags :**

Morison and Hurn, 377.

**Noise :**

Preventing ;  
Helbronner, 161.  
Lillie, 175.  
Wilson, 528.  
Scott, 550, 581.  
Brooman, 616.  
Durant, 633.

**Ocean Floats :**

Deale, 304.

**Odorizing :**

Varroc, 360.

**Oil :**

Holding ;  
Bonnall, 514.

**Oils :**

Lubricating ;  
Deutsch, 255.  
Johnson, 258.  
Reid, 608.  
Treating ;  
Deutsch, 255.  
Johnson, 258.  
Pidding, 275.  
Fall, 356.  
Johnson, 561.  
Parkes, 584.  
Reid, 608.  
Johnson (*Lemottais and Boniere*),  
640.  
Vulcanizing ;  
Parkes, 584.

**Omnibusses :**

Durant, 633.

**Ores :**

Treating ;  
Perkes, 215.

**Organic matters :**

Treating, &c. ;  
Johnson, 469.

**Ornamental coverings or fabrics :**

Pidding, 287, 297.  
Scoutetten, 315.  
Pidding, 390.  
Drew, 396.  
Goodyear, 575.  
Pidding, 668.

**Ornamenting :**

Nichol, 236.  
Gerard, 268.  
Riddle, 264.  
Gilbee, 327.  
Goodyear, 363.  
Abate, 442.  
Devincenzi, 444, 459.  
Guichard, 481.  
Brindlay, 486.  
Sinclair or Berriedale, 510.  
Smith, 515.  
Green and Pickett, 516.  
Brooman, 522.  
Rioux, 567.  
Richardson, 646.

**Packages :**

Prevention of moisture into ;  
Dickinson, 13.  
Travelling ;  
Day's, 307.

**Packing :**

Bodies ;  
Fanshawe, 61.  
Goods ;  
St. André, 340.

**Packings :**

Engine, &c. ;  
Haines, 145.  
Radley and Meyer, 155.  
Mackintosh, 201.  
Houston, 209.  
Tuck, 220.  
Hall, 243.  
Asbury, 271.  
Tayler, Griffiths, and Lees, 364.  
Waller, 463.  
Jefferis, 466.  
Tuck, 501.  
Gregory and How, 540.  
Coffin, 566.  
Harlow, 628.  
Heald, 638.

**Pad :**

Air ;  
Clark, 11.

**Pails :**

Poole (*Goodyear*), 202.  
Johnson, 559.

**Paints.** See Colours.

**Palates :**

Of mouth;  
Bartlett, 101.  
Schoofs, 539.  
Truman, 535.  
Ninck, 632.

**Pamphlets :**

Nickels, 84.

**Pannels :**

Wilkinson, 252.  
Wilson, 256.

**Paper :**

Coating;  
Hancock, C., 98.  
Cornides, 533.  
Combining with;  
Burke, 93.  
Hancock, C., 98.  
Pidding, 297.  
Clarke, 319.  
Cutting;  
Goodall, 152.  
Cuttings;  
Pidding, 297.  
Gutta percha into;  
Hancock, C., 98.  
Manufacturing;  
Harlow, 460.  
Cowley, 632.  
Ornamenting;  
Gilbee, 327.  
Sinclair, or Berriodale, 510.  
Green and Pickett, 516.  
Safety;  
Johnson, 238.  
Tracing;  
Die, 464.  
Waterproof;  
Kerr, 56.  
Bossy, 87.  
Burke, 93.  
Foster, 117.  
Brindley, 139.  
Menotti, 164.  
Froggart, 168.  
Harlow, 460.  
Muschamp, 602.  
Cowley, 632.

**Paper-hangings :**

Brindley, 139.  
Trumble, 428.

**Paper Knife :**

Goodyear, junr., 638.

**Papier Mâché :**

Substitute for, &c.;  
Warren, 217.  
Clarke, 349.  
Brooman, 354.

**Parchment :**

Converting into leather;  
Hitchcock, 7.

**Pasteboard :**

Manufacturing;  
Harlow, 460.

**Pattens :**

Walker, 251.

**Patterns :**

Producing;  
Brooman, 232.

**Parasols :**

Poole (*Goodyear*), 193.  
Restell, 338.  
Dawson, 440.  
Friend, 553.

**Paving :**

Roads, &c.;  
Freeman, 58.  
Marshall, 67.  
Cassell, 77.  
Lillie, 175.  
Haichois, 603.

**Piercing :**

Woodcock, 380.

**Pencils**

Goodyear, 342.

**Penholders**

Bertolacci, 228.  
Johnson, 559.  
Paget, 577.  
Nolet, 600.  
Shelhorn, 601.  
Goodyear, 618.  
Welch, 638.  
Taylor, 642.

**Perfuming :**

Varroc, 360.  
Hill, 551.

**Pens :**

Goodyear, 342.  
Johnson (*Prince*), 545.  
Johnson, 559.  
Johnson (*Steinlen*), 599.  
Welch, 638.

**Phosphorous :**

Nickels, C., 134.

**Pickers :**

For weaving;  
Radcliffe, 433.  
Heald, 638.  
Newton, 648.

**Pictures :**

- Frames of :
  - Poole (*Goodyear*), 200.
  - Illakowicz, 439, 503.
  - Johnson, 559.

**Pills :**

- Coating :
  - Cox, 453.

**Pipes :**

- Hebert, 61.
- Cassell, 77.
- Haines, 147.
- Radley and Meyer, 155.
- Pidding, 176.
- Dick, 376.
- Davis, 396.
- Skidmore and Bolton, 506.
- Farjon, 519.
- Chamcroy, 520.
- Monchil, 534.
- Johnson, 559.
- Pidding, 578.

**Pistols :**

- Poole (*Goodyear*), 197.
- Johnson, 559.

**Pistons :**

- Robson, 63.
- De Berque, 135.
- Browne, 136.
- De Berque, 153.
- Radley and Meyer, 155.
- Houston, 209.
- Tuck, 220.
- Sinclair, 231.
- Peterson, 295.
- Vion, 408.
- Waller, 463, 465.
- Bellford, 486.
- Mather, 518.
- Brooman, 570.
- Travis and Casartelli, 609.
- Craddock, 634.

**Pitchers :**

- Poole (*Goodyear*), 202.
- Johnson, 569.

**Pivots :**

- Couchman, 215.

**Plans :**

- In relief :
  - Guesdon, 401.
  - Brooman, 473.

**Plantain species :**

- Preparing, &c. ;
  - Lilley, 346.

**Plates :**

- Marking :
  - Shaw, 520, 526.
- Rivetting :
  - Mabon, 409.

**Playthings :**

- Lotsky, 245.

**Pneumatic Machines :**

- Walker, 114.

**Pontoons :**

- Self-inflating :
  - Goodyear, 555.

**Portfolios :**

- Nickels, 84.
- Perry, 101.
- Douse, 109.
- Poole (*Goodyear*), 200.
- Willson, 413.
- Ebert and Levisohn, 530.

**Postage Stamps :**

- Affixing :
  - Naylor, 353.
  - Bogue, 474.

**Pottery :**

- Manufacturing :
  - Kerr, 56.
  - Blashfield, 477.
  - Hall, 503.

**Powder Flasks :**

- Hoffstaedt and Blackwell, 543.

**Preparing**

- Gutta percha :
  - Hancock, C., 76.
  - Brooman, 79, 81.
  - Clark, 84.
  - Keene, 85.
  - Bewley, 88.
  - Hancock, C., 91, 98.
  - Brockedon and Hancock, T., 106.
  - Hancock, C., 111.
  - Forster, 117.
  - Hancock, 118.
  - Foster, 120.
  - Hancock, T., and Phillips, 123.
  - Barlow and Forster, 127.
  - Hancock, 127.
  - Lorimier, 128.
  - Nickels, C., 133.
  - Plummer, 140.
  - Burke, 142.
  - Dalton, 144.
  - Payne, 145.
  - Gerard, 154.
  - Lucas, 163.
  - Bucholz, 165.
  - Moulton, 174.
  - Richards, 182.
  - Dixon and Dodson, 188.
  - Burgess, 189.
  - Gaullie, 191.
  - Rider, 192.
  - Bell, 206.
  - Tatham and Cheetham, 213.
  - Perkes, 216.
  - Coolcy, 222.

Preparing—*cont.*

Ley, 232, 232.  
 Brackenbury, 243.  
 Dresser, 251.  
 Watson, 252.  
 Fife, 263.  
 Pidding, 279.  
 Dundonald, 282.  
 Nickels, E., 290.  
 Nickels, C., 290.  
 Duncan, 301.  
 Barrett, 309.  
 Valls, 331.  
 Duncan, 343.  
 Brooman, 354.  
 Johnson (*Desoille*), 356.  
 Rider, 382.  
 Johnson (*Levere*), 383.  
 Wright, Wright and Asbury, 387.  
 Fry, 393.  
 Edwards, 419.  
 Assanti, 434.  
 Ryder and Ryder, 435.  
 Perkins, 447.  
 Forty and Haynes, 449.  
 Willis, 453.  
 Bellford, 454.  
 Johnson, 480.  
 Johnson, 490.  
 Green and Pickett, 517.  
 Brooman, 522.  
 Duvivier and Chaudet, 526.  
 Goodyear, 552.  
 Cornides, 553.  
 Johnson, 561.  
 Godefroy, 565.  
 Ford, 581.  
 Johnson (*Wacrenier*), 588.  
 Latta, 590.  
 Jeune, 604.  
 Metcalf, 617.  
 Rider, 625.  
 Boustfield, 635.  
 Newton, 637.  
 Johnson (*Lemotais and Bonier*,  
*jun.*), 640.  
 Taylor, 642.  
 Danne, 644.  
 Day, 645.  
 Spill, 650.  
 Pidding, 658.  
 India rubber;  
 Peal, 5.  
 Bellamy, 5.  
 Johnson, 6.  
 Clarke, 11.  
 Hancock, 15.  
 Macintosh, 18.  
 Hancock, T., 21, 22, 23.  
 Berry, 23.  
 Hancock, T., 29.  
 Sievier, 30.  
 Dumeste, 31.  
 Walton, 31.  
 Westhead, 37.  
 Sievier, 37.

Preparing—*cont.*

Martin, 38.  
 Hartley, 39.  
 Pickersgill, 39.  
 Nickels, C., 40.  
 Hancock, T., 42, 45.  
 Hancock, J., 55.  
 Keene, 57.  
 Freeman, 58.  
 Hancock, W., junr., 60, 62.  
 Hancock, C., 64.  
 Clark, 64.  
 Austin, 65.  
 Hartley, 66.  
 Drake, 66.  
 Hancock, W., 68.  
 Hancock, T., 69.  
 Newton (*Goodyear*), 71.  
 Galloway, 72.  
 Bedells, 73.  
 Nickels, C. and B., 73.  
 Foster, 74.  
 Alsop and Foster, 79.  
 Perry, 79.  
 Nickels, C., 80.  
 Perry and Daft, 81.  
 Tylor, 82.  
 McIntosh, 83.  
 Masters, 86.  
 Newton, 87.  
 Fuller, 89.  
 Nickels, B., 90.  
 Watney, 90.  
 Bielefield, 91.  
 Burke, 93.  
 Kloet, 95.  
 Hancock, T., 96.  
 Parkee, 97.  
 Perry, 101.  
 Wright, 102.  
 Middlemore, 103.  
 Holdsworth, 104.  
 Nalder, 104.  
 Hale, 105.  
 Bingley, 108.  
 Dowse, 109.  
 Daft, 110.  
 Moulton, 110.  
 Hancock, C., 111.  
 Nickels, C., 115.  
 Daft, 116.  
 Forster, 117.  
 Hancock, C., 118.  
 Tyrrell, 119.  
 Fisher, 120.  
 Hancock, T., 121.  
 Westhead, 122.  
 Soward, 122.  
 Hancock, T., and Phillips, 123.  
 Jennings, T., 125.  
 Piggott, 125.  
 Masters, 127.  
 Hancock, C., 127.  
 Walker, 128.  
 Lorimier, 128.  
 Sievier, 132.

Preparing—*cont.*

Meyer, 133.  
 Nickels, C., 135.  
 Clarkson, 137.  
 Kurtz, 138.  
 Alliot, 141.  
 Simpson and Forster, 142.  
 Burke, 142.  
 Munkittrick, 143.  
 Haines, 145.  
 Milwain, 148.  
 Tayler, 151.  
 Gerard, 154.  
 Newton, 157, 158.  
 Longdon and Tabberer, 161.  
 Crossley, 167.  
 Newton, 169.  
 Hodges and Brockedon, 172.  
 Bunn, 173.  
 Moulton, 174.  
 Nickels, C., Ball, and Bagley, 177.  
 Bernard, 180.  
 Poole, 184.  
 Newton, 186.  
 Roberts, 187.  
 Dixon and Dodson, 188.  
 Coleman, 190.  
 Poole (*Goodyear*), 194, 195.  
 Shaw, 195.  
 Poole (*Goodyear*), 197, 198, 199,  
 200, 201, 202, 203, 207.  
 Macintosh, 207.  
 Egan, 214.  
 Johnson, 220.  
 Dresser, 251.  
 Ayckbourn, 254.  
 Murphy, 255.  
 Johnson, 258.  
 Gerard, 258.  
 Huddart, 263.  
 Davis, 267.  
 Archer, 269.  
 Dulaurier, 271.  
 Hadley, 276.  
 Newton, 278.  
 Johnson, 281.  
 Dundonald, 282.  
 Bethell, 283.  
 Nickels, E., 290.  
 Bernard, 293.  
 Nickels, C., 299.  
 Duncan, 301.  
 Gale, 305.  
 Goodyear, 309.  
 Nickels, C., 311.  
 Grahame, 314.  
 Scoutetten, 315.  
 Carpenter, 317.  
 Bateman, 320.  
 Brookes, 325.  
 Christopher and Gidley, 328.  
 Defever, 328.  
 Goodyear, 340, 341, 343, 362, 363.  
 Newton, 367.  
 Gidley and Muschamp, 383.  
 Dickson, 392.

Preparing—*cont.*

Austin, 393.  
 Davis, 396.  
 Johnson (*Guibal, Cumengé*), 396.  
 Johnson (*Guibal*), 397.  
 Wansbrough, 401.  
 Goodyear, 401.  
 Waithman, 402.  
 Corlett, 412.  
 White, 413.  
 Tussaud, 416.  
 Bird, 417.  
 Grace and Jones, 419.  
 Robinson, 424.  
 Moseley, 428.  
 Dawson, 440.  
 Abate, 442.  
 Newton, 448.  
 Forty and Haynes, 449.  
 Newton, 460, 463.  
 Aubusson, 468.  
 Johnson, 469.  
 Cooke, 473.  
 Johnson, 480.  
 Guichard, 481.  
 Johnson, 490.  
 Stoneham, 495.  
 Johnson, 499, 500.  
 Cooke, 514.  
 Green and Rickett, 516.  
 Ross, 521.  
 Brooman, 538.  
 Bursill, 541.  
 Audemars, 543.  
 Penney, 545.  
 Johnson (*Morey*), 548.  
 White, 548.  
 Goodyear, 549.  
 Hill, 551.  
 Goodyear, 552.  
 Cornides, 554.  
 Trotman, 560.  
 Newton, 561.  
 Rioux and de Pariente, 567.  
 Sorel, 569.  
 Goodyear, 572, 573, 574, 575.  
 Johnson (*Day*), 576.  
 Santelet, 578.  
 Job and Tomlinson, 579.  
 Ford, 581.  
 Johnson (*Wacrenier*), 586, 588.  
 Dodge, 594.  
 Johnson, 595.  
 Turner, 597.  
 Haichois, 603.  
 Jeune, 604.  
 Gidley and Christopher, 605.  
 Ford, 608.  
 Duncan, 610.  
 Bousfield, 613, 619.  
 Pellen, 619.  
 Johnson, 620.  
 Lorimier, 627.  
 Newton, 631, 655.  
 Ninek, 632.  
 Johnson (*Morey*), 634.

**Preparing—cont.**

Taylor, 642.  
 Codet-Negrier, 643.  
 Danne, 644.  
 Day, 645.  
 Spill, 650.  
 King, 651.  
 Parker, 651.  
 Burton, 653.  
 Fry, 657.  
 Pidding, 659.  
 Blizzard, 660.

**Presses :**

Perry, 101.  
 Needham and Kite, 339.  
 Tussard, 416.

**Pressure :**

Indicating;  
 Shanks, 399.  
 Measuring;  
 Shanks, 399.  
 Parkinson, 407, 649.  
 Producing;  
 Ruthven, 141.  
 Transmitting;  
 Webster, 622.

**Printing :**

Siever, 35.  
 Hancock, T., 45.  
 ———, C., 63.  
 Galloway, 72.  
 Hancock, C., 98.  
 Jacobs, 133.  
 Christen, 162.  
 Jacobs, 162.  
 Lucas, 163.  
 Melville, 165.  
 Buchholz, 165.  
 Sievier, 166.  
 Bunn, 173.  
 Bessemer, 176.  
 Newton, 186.  
 Leese, junr., 187.  
 Gerard, 259.  
 Stather, 290.  
 Berry and Booth, 306.  
 Duncan, 343.  
 Applegath, 380.  
 Grant, 417.  
 Brown, 431.  
 ———, S. R., 431.  
 Abate, 442.  
 Brindley, 436.  
 Kay, 506.  
 Crossley, 512.  
 Lehugeur and Uttinger, 537.  
 Silbermann, 562, 569.  
 Job and Tomlinson, 570.  
 Green, 610.

**Printing Machines :**

Blankets of;  
 Leese, junr., 68.  
 Dalton, 144.  
 Kay, 506.

**Printing surfaces :**

Producing;  
 Newton, 186.  
 Valls, 331.  
 Graham, 427.  
 Brown, S. R., 431.  
 Devincenzi, 444.  
 Johnson, 454.  
 Devincenzi, 459.  
 Thomson and Barclay, 598.  
 Juvin, 631.

**Projectiles :**

Richards, 182.  
 Clifton, 453.  
 Kennedy, 523.  
 Adams, 524.  
 Thomas, 525.  
 Livsey and Weild, 533.  
 Bursell, 540.  
 Tolhausen (*Herdman*), 587.  
 Hawker's, 589.  
 Bakewell (*Lippincott*), 606.

**Propellers :**

Duncan, 174.  
 Perkes, 216.  
 Hunt, 249.  
 Rowett, 283.  
 Howson, 416.  
 Spiller, 471.  
 Blyth, 533.  
 Trotman, 560.  
 Adams, 561.

**Prunella :**

Substitute for;  
 Goodyear, 635.

**Pumps :**

Robson, 63.  
 De Bergue, 135.  
 Gwynne, 169.  
 Sinclair, 231.  
 Tussard, 416.  
 Bentley, 457.  
 Jefferis, 466.  
 Delpech, 482.  
 Jobard, 495.  
 Bouvet, 500.  
 Mathieu, 503.  
 Gregory and How, 540.  
 Brooman, 570.  
 Goodyear, 574.  
 Webster, 611, 622.  
 Taylor, 632.  
 Holman, 645.  
 Lund, 649.

**Punching :**

De Bergue, 210.

**Purifying :**

Gutta percha;  
 Brooman, 79, 81.  
 Parkes, 97.  
 Hancock, 98.

**Purifying—cont.**

- Forster, 120.
- Duthoit, 179.
- Normandy, 277.
- Rider, 382.
- Johnson (*Lefevre*), 383.
- Johnson (*Lemettais and Bonniere*), 640.
- Day, 643.
- India rubber ;
- Hancock, T., 20, 23.
- Siever, 34.
- Martin, 38.
- Fry, 393.
- Newton, 463.
- Brooman, 538.

**Purses :**

- Knuth, 368.

**Railways :**

- Brockedon, 77.
- Browne, 136.
- Coleman, 190.
- Ware and Fernandez, 247.
- Pym, 202.
- Gale, 305.
- Davis, 564.
- Bowra, 617.

**Railway-carriages :**

- Lifting
- Fontainemoreau, 391.
- Johnson, 653.
- Shifting ;
- Fontainemoreau, 391.
- Johnson, 653.

**Railway-trains :**

- Stopping, &c. ;
- Raymond, 350, 422.

**Razors :**

- Sharpening ;
- Barthelemy, 296.

**Reaping :**

- Brinsmead, 265.

**Reeds :**

- Taylor, 151.
- Johnson, 563.
- Johnson (*Wacrenier*), 571.
- Yeadon and Chapman, 615.

**Reels :**

- Clarke, 496.
- Johnson (*Wacrenier*), 588.

**Refrigerating :**

- Apparatus ;
- Vion, 264.

**Regulating :**

- Supply ;
- Binks, 541.

**Resins :**

- Improvements in ;
- Dundonald, 282.

**Reticules :**

- Knuth, 368.

**Ribbons :**

- Hughes and Denham, 234.

**Rigging :**

- Of ships ;
- Harris, 27.

**Rings :**

- Perry, 101.

**Rinsing :**

- Chabert, 164.

**Rivetting :**

- De Bergue, 210.
- Mahon, 409.
- Coutts, 637.

**Rocks :**

- Kerr, 56.
- Liebhaber, 164.
- Newton, 399.

**Rods :**

- Poole (*Goodyear*), 201.
- Johnson, 659.

**Rollers :**

- Knocking and crushing ;
- Nickels, C., 134.
- Bessemer, 242.
- Nickels, C., 299, 311.
- Printing, &c. ;
- Hancock, C., 47.
- Nickels, 53.
- Leese, junr., 58.
- Beard, 68.
- Tatham, Cheestham, and Duncan, 102.
- Mason and Collier, 141.
- Dalton, 144, 149.
- Richards, Taylor, and Wylde, 150.
- De Witte, 151.
- Newton, 186.
- Lucas, 163.
- Buchholz, 165.
- Leese, junr., 187.
- Dixon and Dobson, 188.
- Coleman, 190.
- Tatham and Cheestham, 212.
- Godefroy, 218.
- Watt, 240.
- Lister, 282, 285.
- Stather, 290.
- Lister, 330.

**Rollers—cont.**

Brooman (*Peroncel*), 334.  
 Lister, 348.  
 Newton, 367.  
 Grant, 417.  
 Dalton, 429.  
 Johnson, 454.  
 Kay, 506.  
 Sinclair or Berriedale, 510.  
 Perry, 513.  
 Green and Pickett, 516.  
 Marie, 517.  
 Lucas, 543.  
 Johnson, 559, 563.  
 Johnson (*Wacrenier*), 586.  
 Thornton's, 586.  
 Lister, 588.  
 Johnson (*Wacrenier*), 588.  
 Green, 610.  
 Lorimer, 627.  
 Brooman (*Courtelle*), 629.  
 Goodyear, 635.  
 Underhill, 643.  
 Burton and Pye, 653.  
 White and Bull, 653.  
 Newton, 655.  
 Walton, 660.

**Roofs :**

Fox, 72.  
 Galloway, 72.  
 Brockedon, 77.  
 Cassell, 77.  
 Foster, 146.  
 Poole (*Goodyear*), 203.  
 Walker, 241.  
 Fontainemoreau, 277.  
 Grahame, 314.  
 Fontainemoreau, 346.  
 Cooke, 514.  
 Job and Tomlinson, 579.  
 Newton, 630.

**Ropes :**

Harris, 27.  
 Sievier, 30.  
 Wilkinson, 279.  
 Newall, 553.

**Rot :**

Dry;  
 Cook, 16.

**Rotting :**

Prevention of;  
 Whytock, 10.

**Roving :**

See Spinning.

**Sack or shirt :**

Life-preserving;  
 Bunker, 636.

**Saddlery :**

Hancock, T., 15, 20.  
 Davy, 44.  
 Perry and Daft, 81.  
 Middlemore, 103.  
 Binns, 230.  
 Blackwell, 286, 287.  
 Cochran's, 286.  
 Bowra, 309.  
 Brooman, 332.  
 Banner, 391.  
 Bielefeld, 569.  
 Shearman, 630.  
 Lejeune (*Brunessaur*), 653.  
 De Clippéle, 656.

**Safes :**

Gardissal, 485.

**Sand :**

To rails;  
 Beall, 398.

**Sawing :**

Machinery;  
 Brooman, 420.  
 Exall, 599.

**Scaffolding :**

Davis, 335.

**Scales :**

Graduating, &c.;  
 Mackenzie and Blair, 209.  
 Goodyear, 362.

**Scraps :**

Use of;  
 Ross, 521.  
 Lorimer, 627.

**Screens :**

Barker, 323.

**Scutching :**

Machine for;  
 Egan, 214.  
 Koch, 630.

**Sea-sickness :**

Preventing;  
 Wertheimer, 471.

**Seats :**

Goodyear, 343.  
 Life-preserving;  
 Thompson, 509.

**Seeds :**

Preserving;  
 Fontainemoreau, 497.



Setting :

Knives, &c. ;  
Deplanque, 633.

Sewerage :

Hale, 105.

Sewing-machines :

Szontagh, 508.

Shades :

Barker, 323.

Sharpening :

Deplanque, 623.

Sheathing :

Poole (*Goodyear*), 203.

Sheets :

Hancock, T., 29.  
Pickersgill, 39.  
Hancock, T., 45.  
Nickels, C., 53.  
Burke, 142.  
Brooman (*Peroncel*), 334.  
Willis, 453.

Shellac :

Dissolving ;  
Normandy, 83.

Shell-lac :

Dissolving in alkali, &c. ;  
Blades, 25.

Sheltering :

Santelet, 578.

Ships :

Forster, 146.  
Grantham, 147.  
Pidding, 176.  
Poole (*Goodyear*), 203.  
Feather, 244.  
Pinch and Lampport, 358.  
Grahame, 378.  
Woodward, 450.  
Varlet, 462.  
Betteley, 508.  
Cooke, 514.  
Newall, 553.  
Johnson, 559.  
Murton, 563.  
Blackwood, 625.

Bottoms of ;

Hancock, T., 22.  
Poole (*Goodyear*), 203.  
Robinson, 425.  
Ford, 581, 608.

Caulking :

Duncan, 501.  
Cooke, 514.

Propelling :

Duncan, 174.

Ships—*cont.*

Raising ;  
Gougy, 108.  
Ventilating ;  
Roberts, 187.

Shoes

Sylvanus, 2.  
Peal, 5.  
Walker and Alphey, 8.  
Hancock, T., 15, 20, 30.  
Dowie, 44.  
Keene, 85.  
Wright, 102.  
Fisher, 120.  
Hancock, C., 127.  
Lorimier, 128.  
Walker, 128.  
Clark, 133.  
Webley, 170.  
Bernard, 180.  
Poole, 191.  
Bernard, 193.  
Stoll, 226.  
Parker and Dicks, 261.  
Dulaurier, 270.  
Bernard, 293.  
Day, 303.  
Newton, 322.  
Duncan, 343.  
Foster, 347.  
Scott, 357.  
Goodyear, 386.  
Grace and Jones, 419.  
Cortin, 439.  
Bellford, 454.  
Scott, 458.  
Cooke, 473.  
Stocker, 507.  
Pope, 513.  
Mason and Beeby, 515.  
Pidding, 539.  
Martin and Hyams, 539.  
Hodges, 546.  
Kennedy, 547.  
Bousfield, 570.  
Pidding, 571.  
Clark's, 579.  
Hubbard, 582.  
Goodyear, 587.  
Hibling, 587.  
Rice, 589.  
Ritchie, 615.  
Brooman (*Gaillard*), 623.  
Founobert, 624.  
McDonald (*Hayward*), 628.  
Grundy, 639.  
Turner, 640.  
Newton, 642.  
Codet-Negrier, 643.  
McKinley and Walker, 618.  
Ring, 651.  
Scott, 652.  
De Clippele, 656.

**Shoes—Cont.**

- Corrugating ;
- Pidding, 529.
- Goodyear, 587, 635.
- Scott, 632.
- Of horses, &c. ;
- Rotch, 28.
- Keene, 85.
- Watney, 90.
- Lillie, 175.
- Newton, 332.
- Scott, 458.
- Pidding, 539.
- Johnson, 559.
- Pidding, 571.
- Scott, 632.

**Shutters :**

- Camera ;
- Skaffe, 605.

**Shutters :**

- Raising, &c. ;
- Russell, 317.
- Soward, 122.
- Milwain, 148.

**Shuttles :**

- Bingley, 108.
- Taylor and Slater, 225.
- Vaughan and Scattergood, 441.
- Fletcher, 557.
- Johnson, 559.
- Johnson (*Wacrenier*), 571.

**Signalizing :**

- Archer, 183.
- Holden, Bull, and Knight, 206.
- Archer, 268.
- Hadley, 275.
- Walmsley and Critchley, 280.
- Palmer, 311.
- Price, 391.
- Cooks, 384.
- Fontainemoreau, 391.
- Walker, 391.
- Chalmers, 395.
- Watson, 415.
- Thuribby, 421.
- Wickens, 425.
- Bellford, 426.
- Biddell, 448.
- Wickens, 489.
- Smith, 584.
- Palmer, 600, 621.

**Sister-hooks :**

- Murton, 563.

**Skins :**

- Preparing ;
- Johnson (*Chaumont*), 511.

**Slates :**

- Quarrying ;
- Dixon and Dobson, 183.
- Writing ;
- Dixon and Dobson, 183.
- Hughes, 358.
- Harrold, 560.

**Sleepers :**

- Of railways ;
- Brockedon, 77.
- Cassell, 77.

**Slippers :**

- Pidding, 539.
- Goodyear, 635.

**Soap :**

- Making ;
- Pidding, 275.
- Johnson, 595.

**Socks :**

- Boot and shoe ;
- Grace and Jones, 419.

**Sofas :**

- Poole (*Goodyear*), 207.

**Solutions :**

- Transparent ;
- Gidley and Christopher, 686.
- Without smell ;
- Gidley and Muschamp, 383.

**Solvents :**

- New ;
- Blades, 24.
- Sivier, 37.
- Martin, 38.
- Parke, 66, 97.
- Forster, 117.
- Fontainemoreau, 134.
- Simpson and Foster, 142.
- Stones, 150.
- Gerard, 154.
- Johnson (*Descille*), 356.
- Johnson (*Lefevre*), 353.
- Fry, 393.
- Newton, 402.
- Brooman, 538.
- Cornides, 553.
- Ford, 581.
- Dodge, 594.
- Metcalfe, 617.
- Pellen, 619.
- Codet-Negrier, 643.
- Preparing ;
- Martin, 38.
- Saving ;
- Hancock, W., 68.
- Johnson (*Guibal and Chammey*), 396.

# INDEX OF SUBJECT MATTER.

693

## Solvents—*cont.*

- Assanti, 434.
- Cornides, 532.
- Use of vapour of;
  - Hancock, W., 60.
  - Brooman, 538.

## Spatterdashes :

- Parker and Dicks, 261.

## Spindles :

- Tatham and Cheetham, 155.

## Spinning :

- Hancock, T., 22.
- Harris, 25, 27.
- Siever, 30.
- Walton, 32.
- Nickels, C., 40.
- Robertson, 46.
- Nickels, C., 65.
- Alsop and Foster, 78.
- Tatham, Cheetham, and Duncan, 102.
- Platt and Palmer, 116.
- Mason and Collier, 141.
- Nickels, C., 146.
- Richards, Taylor, and Wylde, 150.
- Taylor and Hurst, 141.
- Tatham and Cheetham, 155.
- Newton, 157.
- Nickels, C., Ball, and Bagley, 177.
- Hughes and Denham, 234.
- Fontainemoreau, 240.
- Watt, 240.
- Rothwell, 247.
- Thornton, S., 262.
- Nickels, C., 283.
- Houston, 294.
- Pidding, 297.
- Fairbairn and Kaselowsky, 307.
- Carpenter, 315.
- Bateman, 320.
- Green, 321.
- Barlow, Johnson, Slater, and Knowles, 464.
- Houghton and Royle, 484.
- Benfrew, 510.
- Marie, 517.
- Ashworth and Stott, 536.
- Lucas, 543.
- Russon, 551.
- Fletcher, 567.
- Johnson, 559, 568.
- Butcher and Newey, 579.
- Barlow, 581.
- Johnson (*Wacrenier*), 586.
- Thornton's, 586.
- Lester and Warburton, 588.
- Johnson (*Wacrenier*), 588.
- Marland, 640.
- Walton, 660.

## Splitting :

- Machine ;
  - Stansbury (*Merrian and Crosby*), 578.

## Sponge :

- Gutta Percha, &c. ;
  - Hancock, C., 91, 111.
  - Fisher, 120.
  - Newton, 156.
  - Cooke, 514.

## Springs :

- Bandages ;
  - Perry and Daft, 81.
- Belts ;
  - Perry and Daft, 81.
- Blinds ;
  - Perry, 79.
  - Parker, 323.
- Breeches ;
  - Bentley, 257.
- Candle-lamps ;
  - Perry, 79.
- Carriage ;
  - Lacy, 24.
  - Fuller, 89.
  - De Bergue, 117, 125, 135.
  - Spencer, 181.
  - Hodge, 181.
  - Fuller and Knevitt, 210.
  - Oates, 219.
  - Burch, 255.
  - De Bergue, 291.
  - Bell, 310.
  - Leverson, 324.
  - Corlett, 412.
  - Fuller, 537.
  - Managlia, 544.
  - Halcy, 568.
  - Richardson, 589.
  - Préaud, 591.
  - Myers, 594.
  - Hooper's, 596.
  - Newton, 597.
  - Corbet and Shaw, 601.
  - Hooper, Fry, and Nasmyth, 625.
- Cutting machine ;
  - Jouquet, 588.
- Corset ;
  - Poole (*Goodyear*), 195.
- Door ;
  - Perry, 79.
  - Couchman, 215.
  - Hodges and Murray, 540.
- Dress ;
  - Hancock, 15.
  - Poole (*Goodyear*), 195.
- Fastening to ;
  - Hodges, 388.
- Girth ;
  - Perry and Daft, 81.
- Lock ;
  - Perry, 79.
- Mangle ;
  - Scott and Bennett, 490.
- Paper-holders ;
  - Perry, 79.
- Scissor ;
  - Jouquet, 588.

**Springs—cont.**

Shuttle;  
 Bingley, 108.  
 Trowsers;  
 Bentley, 257.  
 Sundry;  
 Newton, 140.  
 De Witte, 151.  
 Coleman, 190.  
 Brown, 206.  
 De Berque, 210.  
 Bellford, 213.  
 Lamb, 219.  
 Rothwell, 247.  
 Brooman, 268.  
 Constable, 269.  
 Asbury, 271.  
 Mellish, 274.  
 Sy, 278.  
 Walmsley and Critchley, 280.  
 Gaskell, 338.  
 Tayler, Griffiths, and Lees, 364.  
 Mermct, 385.  
 Hodges, 388.  
 Fuller, 467.  
 Scott and Bennett, 490.  
 Keen, 491.  
 Betteley, 508.  
 Johnson (*Chaumont*), 511.  
 Ashworth and Stott, 536.  
 Hoffstaedt and Blackwell, 543.  
 Fletcher, 557.  
 Adams, 561.  
 Shears, 577.  
 Church, 580.  
 Scott, 581.  
 Krupp, 592.  
 Hooper's, 596.  
 Zahn and Wells, 597.  
 Newton, 597.  
 Johnson (*Steinlen*), 599.  
 Gizard, 601.  
 Skaife, 605.  
 Davies, 607.  
 Eaton, 624, 626.  
 Koch, 630.  
 Reynaud, 631.  
 Goodyear, 636.  
 Chadwick and Frost, 640.  
 White and Bull, 653.  
 Simpson's, 657.  
 Window-sash;  
 Perry, 79.

**Stamping :**

Metals, &c.;  
 Bentley and Alcock, 644.

**Stamps :**

Affixing;  
 Naylor, 353.  
 Bogue, 474.

**Stairs :**

Job and Tomlinson, 579.

**Stands :**

Poole (*Goodyear*), 207.

**Steam :**

Admitting;  
 Bellford, 437.

**Steam-boilers :**

Swan, 140.  
 Hall, 243.  
 Normandy, 318.  
 Culpin, 305.  
 Tayler, Griffiths, and Lees, 364.  
 Farmer, 462.  
 Newton, 475.  
 Johnson, 593.  
 Harlow, 628.  
 Craddock, 634.

**Steam-engines :**

Hale, 105.  
 Walker, 114.  
 Haines, 145.  
 Radley and Meyer, 155.  
 Duncan, 174.  
 Macintosh, 201.  
 Houston, 209.  
 Tuck, 220.  
 Hall, 243.  
 Palmer, 314.  
 Griffiths, 371.  
 Poole, 393.  
 Waller, 463, 465.  
 Martini, 473.  
 Craddock, 503.  
 Gregory and How, 540.  
 Johnson, 593.  
 Travis and Casertelli, 609.  
 Johnson, 626.  
 Craddock, 634.

**Stoppering :**

Glover, 244.  
 Bellford, 251.  
 Scott, 268.  
 Bellford, 270.  
 Ash, 273.  
 Mellish, 274.  
 Labat, 370.  
 Johnson, 480.  
 Stocker, 482.  
 Johnson, 487.  
 Stansbury, 493.  
 Crapelet, 558.

**Steam-pressure :**

Alliott, 141.  
 Culpin, 305.  
 Normandy, 318.  
 Parkinson, 407.  
 Smith, 527.

**Steam-pressure—*cont.***

Porteous, 591.  
Long's, 654.

**Stereoscope :**

Shears, 577.

**Stereotype :**

Plates;  
Newton, 266.  
Johnson, 559.

**Stereotyping :**

Michel, 214.  
Nichol, J., 236.

**Stitching :**

Machinery;  
Bernard, 460.

**Stocks :**

Walker, 128.  
Bentley, 248.  
Winiwarter, 280.

**Stone :**

Quarrying, &c.;  
Liobhaber, 164.  
Dixon and Dobson, 188.  
Brooman, 326.  
Treatment of;  
Barrett, 308.  
Sawing;  
Brooman, 420.  
Exall, 599.

**Stone (artificial) :**

Treatment of;  
Barrett, 308.

**Stoppers :**

Berry, 23.  
Hancock, C., 76.  
Beltzung, 185.  
Mellish, 274.  
Jennings, 432.  
Woodward, 450.  
Johnson, 460.  
Methvin, 565.

**Stopping :**

Bottles;  
Taylor, 388.  
Crapelet, 558.  
Trains;  
Raymond, 422.

**Stoves :**

Brookes, 322.

**Straps :**

Wharton, 95.  
Perry, 101.  
Walker, 128.  
Burke, 142.  
Wilkinson, 279, 375.  
Goodyear, 573.  
Bousfield, 618.  
De Clippéle, 656.

**Strings :**

Perry, 101.

**Stuffs :**

Ornamenting;  
Gilbu, 327.

**Stuffing-boxes :**

Tuck, 220.  
Vion, 408.  
Craddock, 634.

**Substitutes :**

For bone;  
Lepage, 582.  
For canvass;  
Galloway, 72.  
For gutta percha;  
Warren, 217.  
Le Gras and Gilpen, 228.  
Wilkinson, 252.  
Brooman, 354.  
Sorel, 411.  
Forty and Haynes, 440.  
Achereau, 450.  
Hitchens and Batley, 466.  
Johnson, 561.  
Lepage, 582.  
Hughes, 627.  
Sorel, 645.  
For india-rubber;  
Sorel, 411.  
Rimmel (*Magen*), 521.  
Johnson, 561.  
Hughes, 627.  
Goodyear, 635.  
Sorel, 645.  
For leather;  
Hancock, T., 20, 21.  
Nickels, C., 84.  
Ley, 232.  
Gerard, 258.  
Forty and Haynes, 440.  
Job and Tomlinson, 579.  
Lepage, 582.  
For metal;  
Lepage, 582.

**Substitutes—*cont.***

- For millboard ;  
Ley, 232.  
Child, 365.
- For oilcloth ;  
Ley, 232.
- For wood ;  
Brooman, 354.  
Hitchins and Balbey, 466.  
Lepage, 582.
- For whalebone ;  
Poole (*Goodyear*), 195.  
Dresser, 251.

**Sugar :**

- Moulds ;  
Bessemer, 341.  
Nash, 456.  
Welsh, 517.

**Sulphide of phosphorus :**

- Use of ;  
Duvivier, 526.

**Sulphur :**

- Fumes of ;  
Nickels, C., 134.  
Tomlinson and Job, 585.

**Sun :**

- Rays of ;  
Foster, 74

**Surfaces :**

- Curved ;  
Silbermann, 562, 569.
- Printing ;  
Newton, 266, 278.  
Graham, 427.  
Goodyear, 572.

**Syringes :**

- Bewley, 88.

**Tables :**

- Poole (*Goodyear*), 207.

**Tags :**

- Forming, &c. ;  
Hollingsworth, 423.

**Tanneries :**

- Hair from ;  
Sautelet, 578.

**Taps :**

- Jennings, 124.  
Wilkinson, 257.  
Perks, junr., 340.  
Bird, 417.

**Taps—*cont.***

- Rickard, 418.  
Galloway, 443.  
Kraut, 470.  
Smith and Phillips, 540.  
Barr, 543.  
Stones, 556.  
Sheppard, 593.  
Bestwick and Bury, 598.  
Harlow, 605.  
Derbyshire, 612.

**Tar :**

- Hancock, T., 22.  
J., 55.  
Kerr, 56.  
Poole (*Goodyear*), 194.

**Tea-caddies :**

- Taylor, 352.

**Teazles :**

- Metallic ;  
Newton (*Nos d'Argence*), 589.

**Teeth :**

- Bartlett, 101.  
Truman, 131.  
Mosely, 253.  
Gilbert, 438.  
Mosely, S., 445.  
Stocker, 507.  
Goodyear, junr., 549.  
Schoofs, 559.  
Truman, 585.  
Ninck, 632.  
Maurice, 636.

**Telegraphs :**

- Johnson (*Theilar*), 468.  
Palmer, 600, 621.

**Template :**

- Shaw, 520, 526.

**Temples :**

- Taylor and Slater, 225.  
Vaughan and Scattergood, 358.  
Markland, 479.

**Tenacious :**

- Rendering ;  
Willis, 453.

**Tenders :**

- Clewe, 550.

**Tents :**

- Jackson, 488, 538.  
Lewis and Gurney, 550.

- Thrashing :**  
Wheat, &c.;  
Ellins, 373.
- Thread :**  
Harris, 27.  
Sievier, 30.  
Desgrand, 31.  
Dumeste, 31.  
Hartley, 39.  
Nickels, C., 40.  
Hancock, T., 45.  
Alsop and Foster, 78.  
Cotter, 78.  
Brooman, 81.  
Newton, 87.  
Hancock, C., 111.  
Forster, 117.  
Gerard, 253.  
Pidding, 297.  
Green, 321.  
Bessemer, 327.  
McCus, 427.  
Hackett, 488.  
Brooman, 522.  
Audemars, 542.  
Housfield, 614.  
Newton (*Davenport*), 618.  
Brooman (*Courtielle*), 629.
- Thimbles :**  
Ships, &c.;  
Newton, 563.
- Thermometers :**  
Constructing;  
Tizard, 356.
- Tickets :**  
Railway;  
Wall, 512.
- Tiles :**  
Kerr, 56.  
Pidding, 176.  
Fontainemoreau, 277, 346.  
Wright and Green, 545.
- Timber :**  
Fireproofing;  
Cook, 16.
- Tissues :**  
Elastic;  
Fontainemoreau, 240.
- Tobacco :**  
Pipes;  
Johnson, 559.  
Pouches;  
Knuth, 368.
- Toys :**  
Pellen, 619.
- Traps :**  
Gas and air;  
Bell, 161.
- Trimnings :**  
Hughes and Denham, 234.
- Troughs :**  
In photography;  
Bourquin, 418.
- Trowsers :**  
Masters, 86.  
Ferguson and Lillie, 374.
- Trucks :**  
Eassie, 417, 484.  
Raising, &c.;  
Johnson, 653.
- Trunks :**  
Poole (*Goodyear*), 202.  
Johnson, 559.
- Trumpets :**  
Speaking;  
Belleford, 426.
- Tubes :**  
Bewley, 83.  
Hunt, 158.  
Leibhaber, 164.  
Russell, 187.  
Burgess, 189.  
Poole (*Goodyear*), 198, 201.  
Gerard, 258.  
Chatterton, 302.  
Nickels, C., and Selby, 368.  
Dick, 378.  
Farjon, 519.  
Mouchal, 554.  
Johnson (*Steinton*), 599.  
Turner, 599.  
Housfield, 613, 635.  
Hendry and R. H. Hancock, 647.  
Corrugating;  
Burgess, 189.
- Tubs :**  
Poole (*Goodyear*), 302.  
Johnson, 599.
- Turpentine :**  
Venice;  
Wallace, 301.
- Type :**  
Hancock, C., 96.  
Bingley, 108.  
Mackenzie, 130.  
Perkins, 447.  
Johnson, 559.

**Typophanic :**

Roussel, 439.

**Umbrellas :**

Poole (*Goodyear*), 195.  
 Restell, 338.  
 Dawson, 440.  
 Stocker, 507.  
 Friend, 533.

**Urine :**

Receptacle;  
 Ewing, 609.

**Utensils :**

Hancock, 22.  
 Portable;  
 Paine and Ryan, 546.

**Vacuum :**

Casting in;  
 Bernard, 304.

**Valves :**

Brockedon, 77.  
 Hale, 105.  
 Walker, 114.  
 De Bergue, 135.  
 Swan, 140.  
 Roe, 197.  
 Gray, 198.  
 Derrington and Chadwick, 250.  
 Mondollot, 300.  
 Harlow, 331.  
 Taylor, Griffiths, and Lees, 364.  
 Rees, 429.  
 Galloway, 443.  
 Brooks, 457.  
 Farmer, 462.  
 Waller, 463.  
 Kraut, 470.  
 Johnson, 487.  
 Lund, 498.  
 Craddock, 505.  
 White, Henderson, and Couper, 506.  
 Tylor and Frasi, 509.  
 Vauthier, 518.  
 Death and Popplewell, 541.  
 Sheppard, 593.  
 Scully and Heywood, 593.  
 Bestwick and Bury, 596.  
 Dannequin, 596.  
 Perreault, 603.  
 Harlow, 605.  
 Travis and Casartelli, 609.  
 Duncan, 610.  
 Webster, 611.  
 Derbyshire, 612.  
 Webster, 622.  
 Johnson, 626.

**Valves—*cont.***

Taylor, 632.  
 Craddock, 634.  
 Goodyear, 635.  
 Heywood, 641.  
 Holman, 645.  
 Lund, 649.  
 Brooman (*Guyot*), 659.

**Varnish :**

Lemoine, 191.  
 Transparent, &c.;  
 Gidley and Christopher, 661.  
 Blizzard, 660.

**Varnishing :**

Gutta-percha;  
 Hancock, C., 98.

**Vats :**

Making;  
 Burton's, 289.

**Vegetable preserver :**

Foster, 74.

**Vegetable substances :**

Use of;  
 Hughes, 627.

**Vehicles :**

Bird and Welch, 230.  
 Scott, 581, 604.

**Velvet pile :**

Finish;  
 Morphet, 623.

**Veneering :**

Hancock, C., 98.  
 Newton, 276.

**Veneers :**

Wilkinson, 252.

**Vermin :**

Preventing;  
 Clarke, 349.

**Vessels :**

Forster, 146.  
 Grantham, 147.  
 Pidding, 176.  
 Roberts, 187.  
 Perkes, 216.  
 Rife, 263.



**Vessels—cont.**

- Grahame, 378.
- Bellford (*Corbett*), 542.
- Goodyear, 574.
- Grahame, 582.
- Newton, 636.
- Air-tight ;
- Stansbury, 493.
- Communicating from
- Sibbald, 394.
- Drinking ;
- Poole (*Goodyear*), 202.
- Filling ;
- Mondolot, 300.
- In photography ;
- Bourquin, 418.
- Preventing the admission of mois-  
ture into ;
- Dickinson, 13.
- Hancock, 22.
- Browne, 136.
- Raising ;
- Gougey, 108.

**Voltaic Battery :**

- Hess, 528.

**Vulcanized india rubber :**

- Application of ;
- Hancock, T., 69.
- Newton (*Goodyear*), 71.
- Brookedon, 77.
- Perry, 79.
- Perry and Daft, 81.
- Keene, 85.
- Robinson and Bowden, 96.
- Hancock, T., 96.
- Robinson, 96.
- Perry, 101.
- Middlemore, 103.
- Nalder, 104.
- Hale, 105.
- Brookedon and Hancock, T., 106.
- Bingley, 108.
- Dowse, 109.
- Daft, 110.
- Hancock, C., 111.
- Daft, 116.
- Tyrrell, 118.
- Fisher, 120.
- Soward, 122.
- Hancock, T., and Phillips, 123.
- Jennings, 124.
- Piggott, 125.
- Masters, 126.
- De Bergue, 135.
- Swan, 140.
- Alliott, 141.
- Millwain, 149.
- Richards, Taylor, and Wylde, 150.
- De Witte, 151.
- De Bergue, 153.
- Newton, 156, 157, 159.
- Bell, 161.
- Jacobs, 162.
- Newton (*Goodyear*), 163.

**Vulcanized india rubber—cont.**

- Newton, 170.
- Hodges and Brookedon, 172.
- Lillie, 175.
- Addenbrooke, 179.
- Bernard, 180.
- Spencer, 181.
- Hodge, 181.
- Archer, 183.
- Poole, 191.
- Poole (*Goodyear*), 194, 195.
- Shaw, 195.
- Poole (*Goodyear*), 197.
- Roe, 197.
- Gray, 198.
- Poole (*Goodyear*), 198, 199, 200.
- Mackintosh, 201.
- Poole (*Goodyear*), 201, 202, 203,  
204.
- Davis, 204.
- Dunlop, 205.
- Goodyear, 207.
- Kent, 213.
- Egan, 214.
- Couchman, 215.
- Perkes, 215, 216.
- Daft, 217.
- Ellins, 222.
- Binns, 230.
- Sinclair, 231.
- Kendall, 238.
- Watt, 240.
- Bessemer, 242.
- Houghton, 246.
- Clarke, 247.
- Rothwell, 247.
- Hunt, 246.
- Couchman, 254.
- Murphy, 255.
- Fife, 265.
- Wollowicz, 272.
- Winniwarter, 274.
- Hadley, 275.
- Symington, 281.
- Lister, 285.
- Cochran's, 288.
- Burton's, 289.
- Morgan, 291.
- De Bergue, 291.
- Rider, 292.
- Bernard, 293.
- Villiet, 294.
- Peterson, 296.
- Barthelemy, 296.
- Mondolot, 300.
- Goodyear, 309.
- Jacob, 310.
- Brady, 313.
- Carpenter, 316.
- Normandy, 318.
- Daft, 323.
- Harlow, 331.
- Brooman, 332.
- Rice, 332.
- Bate, 337.
- Restell, 338.

Vulcanized india rubber—*cont.*

Ager, 339.  
 Goodyear, 341.  
 Bessemer, 341.  
 Goodyear, 342, 343.  
 Duncan, 343.  
 Lilley, 344.  
 Foster, 347.  
 Fontainemoreau, 347.  
 Lister, 348.  
 Perks, junr., 349.  
 Raymond, 350.  
 Wilson and Austen, 351.  
 Dewsnap, 353.  
 Naylor, 353.  
 Kimberley, 359.  
 Taylor, 361.  
 Goodyear, 362.  
 Taylor, Griffiths, and Lees, 364.  
 Turner, 366.  
 Newton, 367.  
 Bury and Green, 369.  
 Griffiths, 371.  
 Betjemann, 372.  
 Porter, 373.  
 Coates, 378.  
 Price, 380.  
 Taylor, 388.  
 Hodges, 388.  
 Racster, 389.  
 Parratt, 389.  
 Banner, 391.  
 Austin, 393.  
 Poole, 393.  
 Johnson (*Guibal*), 397.  
 Beall, 398.  
 Goodyear, 401.  
 Bedells, 404.  
 Greenwood, 405.  
 James, 405.  
 Coles, 406.  
 Parker, 407.  
 Vion, 408.  
 Sorel, 411.  
 Howson, 415.  
 Rickard, 418.  
 Grace and Jones, 419.  
 Robinson, 420.  
 Tendall and Trotter, 421.  
 Thurlby, 421.  
 Raymond, 422.  
 Rees, 429.  
 Brown, 431.  
 Collier, 436.  
 De Berque, 441.  
 Abate, 442.  
 Galloway, 443.  
 Mill, 446.  
 Weare, 447.  
 Archercau, 451.  
 Hodges, 455.  
 Nash, 456.  
 Brooks, 457.  
 Scott, 458.  
 Bernard, 460.  
 Waller, 465.

Vulcanized india rubber—*cont.*

Miles, 467.  
 Aubusson, 468.  
 Kraut, 470.  
 Martini, 473.  
 Monzani, 474.  
 McLaine, 475.  
 Newton, 475.  
 Stidolph, 476.  
 Yates, 477.  
 Markland, 479.  
 McGaffin, 480.  
 Stocker, 482.  
 Johnson, 487.  
 Jackson, 488.  
 Scott and Bennett, 490.  
 Ingall, 491.  
 Lund, 496.  
 Johnson, 499, 500.  
 Hancock, J. L., 500.  
 Bouvet, 500.  
 Gray, 502.  
 Matthieu, 503.  
 Danks, 504.  
 Craddock, 505.  
 White, Henderson, and Co., 506.  
 Youil, 507.  
 Szontagh, 508.  
 Poole, 511.  
 Perry, 513.  
 Monzani, 513.  
 Bonnal, 514.  
 Green and Pickett, 516.  
 Marié, 517.  
 Mather, 518.  
 Vauthier, 518.  
 Smith, 527.  
 White, 530.  
 Livesey and Weild, 533.  
 Sinclair or Berriedale, 533.  
 Williams, 534.  
 Pillans, 535.  
 Miles, 537.  
 Jackson, 538.  
 Smith and Phillips, 540.  
 Gregory and How, 540.  
 Death and Popplewell, 541.  
 Daft, 542.  
 Hoffstaedt and Blackwell, 543.  
 Barr, 543.  
 Maneglia, 544.  
 Wright and Green, 545.  
 Johnson (*Prince*), 545.  
 Woodley and Swinford, 546.  
 Goodyear, junr., 549.  
 Hodges and Murray, 549.  
 Busson, 551.  
 Hill, 551.  
 Fanshawe's, 554.  
 Holmes, 557.  
 Crapelet, 558.  
 Johnson, 559.  
 Trotman, 560.  
 Butcher and Neway, 560.  
 Adams, 561.

Vulcanized india rubber—*cont.*

Silbermann, 562.  
 Johnson, 563.  
 Methvin, 565.  
 Salt, 565.  
 Collin, 566.  
 Myers, 567.  
 Bloux and De Parcente, 567.  
 Sorel, 568.  
 Silbermann, 569.  
 Bonnet, 569.  
 Johnson (*Wacrenier*), 571.  
 Goodyear, 572, 573, 574, 575.  
 Bedells, 575.  
 Shears, 577.  
 Paget, 577.  
 Durant, 580.  
 Church, 580.  
 Ford, 581.  
 Barlow, 581.  
 Grahame, 582.  
 Johnson (*Wacrenier*), 586.  
 Thornton's, 586.  
 Johnson (*Wacrenier*), 588.  
 Newton (*Nos d'Argence*), 589.  
 Jennings, 590.  
 Préaud, 591.  
 Porteus, 591.  
 Ford, 592.  
 Johnson, 593.  
 Sheppard, 593.  
 Scully and Heywood, 593.  
 Myers, 594.  
 Dodge, 594.  
 Hooper's, 596.  
 Zahn and Wells, 597.  
 Newton, 597.  
 Chatwins, 598.  
 Turner, 599.  
 Palmer, 600.  
 Shelhorn, 601.  
 Daft, 602.  
 Fuller, 603.  
 Perreux, 603.  
 Beauché, 603.  
 Gollop, 604.  
 Jeune, 604.  
 Harlow, 605.  
 Monckton, 605.  
 Ford, 608.  
 Ewing, 609.  
 Duncan, 610.  
 Green, 610.  
 Bain and Heywood, 612.  
 Derbyshire, 612.  
 Bousfield, 613, 614.  
 Spencer, 614.  
 Livsey, 615.  
 Bown, 617.  
 Goodyear, 618.  
 Ford, 619.  
 Horsfall, 619.  
 Harlon and Henry, 620.  
 Palmer, 621.  
 Lorimier, 622.  
 Morphet, 623.

Vulcanized india rubber—*cont.*

Eaton, 624.  
 Hooper, Fry, and Nasmyth, 625.  
 Eaton, 626.  
 Lorimier, 627.  
 Harlow, 628.  
 McDonald (*Hayward*), 628.  
 Brooman (*Courtelle*), 629.  
 Shearman, 630.  
 Koch, 630.  
 Taylor, 632.  
 Ninck, 632.  
 Deplanque, 633.  
 Cradock, 634.  
 Bousfield, 635.  
 Goodyear, 635.  
 Rolfe, 636.  
 Maurice, 636.  
 Goodyear, 636.  
 Coutts, 637.  
 Goodyear, junr., 638.  
 Heywood, 641.  
 Newton, 642.  
 Taylor, 642.  
 Underhill, 643.  
 Holman, 645.  
 Bunn, 647.  
 Heywood, 647.  
 Henry and R. H. Hancock, 647.  
 Clarke, 649.  
 Lund, 649.  
 Burton and Pye, 653.  
 Lejeune (*Brunessaux*), 653.  
 Long's, 654.  
 Knapton, 654.  
 Newton, 655.  
 Macintosh, 655.  
 Fry, 657.  
 Devon, 658.  
 Brooman (*Guyot*), 659.  
 Walton, 660.  
 Burley, 661.

## Vulcanized materials :

Recovering :  
*See Waste.*

## Vulcanizing :

India rubber, &c. ;  
 Hancock, T., 69.  
 Newton (*Goodyear*), 71.  
 Keene, 85.  
 Hancock, T., 90.  
 Parkes, 97.  
 Brockedon and Hancock, T., 106.  
 Moulton, 110.  
 Hancock, C., 111.  
 Westhead, 120.  
 Nickels, C., 134.  
 Simpson and Foster, 142.  
 Burke, 142.  
 Newton, 156, 157, 159, 170.  
 Moulton, 174.  
 Rider, 192.  
 Poole (*Goodyear*), 194, 195.

**Vulcanizing—*cont.***

Johnson, 220.  
 Cooley, 222.  
 Rider, 382.  
 Ross, 521.  
 Duvivier, 526.  
 Penney, 545.  
 Johnson (*Morey*), 548.  
 Johnson, 563.  
 Parkes, 584.  
 Johnson (*Wacrenier*), 586, 588.  
 Latta, 590.  
 Collins, 595.  
 Turner, 597.  
 Bousfield, 613.  
 Goodyear, 618.  
 Rider, 625.  
 Jeune, 629.  
 Ninck, 632.  
 Johnson (*Morey*), 634.  
 Goodyear, 635.  
 Day, 645.  
 Bunn, 647.  
 Heywood, 647.  
 Hendry and R. H. Hancock, 647.  
 Spill, 650.  
 Parker, 651.  
 Newton, 655.  
 Fry, 657.

**Vulcanized and Unvulcanized :**

Use of ;  
 Hancock and Phillips, 123.  
 Goodyear, 401.  
 Hill, 551.  
 Fanshawe, 554.  
 Fry, 657.

**Waddings :**

Westhead, 139.  
 Blair, 212.

**Wadds :**

Richards, 182.  
 Thomas, 525.

**Waggons :**

Brooman, 616.

**Waistcoats :**

Masters, 86.

**Walls :**

Galloway, 72.  
 Riddle, 264.

**Washing :**

Chabert, 164.  
 Leese, junr., 187.  
 Lister, 530.  
 Sinclair or Berriedale, 533.  
 Thornton's, 586.

**Washing—*cont.***

Bentley and Alcock, 644.  
 Ores ;  
 Tendall and Trotter, 421.

**Washstands :**

Harlow, 331.

**Waste :**

Use of ;  
 Nickels, C., 40.  
 Parkes, 97.  
 Hancock, T., and Phillips, 123.  
 Macintosh, 201.  
 Christopher and Gidley, 322.  
 Goodyear, 401.  
 Ross, 521.  
 Jeune, 604.  
 Ford, 619.

**Water :**

Depth of ;  
 Long's, 654.  
 Force of ;  
 Allott, 141.  
 Measuring ;  
 Taylor, 239.  
 Hanson and Chadwick, 225.  
 Teague, 566.  
 Chadwick and Frost, 640.  
 Proofing ;  
*See* Coating.  
 Raising ;  
 Hancock, J., 59.  
 Walker, 114.  
 Binks, 541.  
 Myers, 567.  
 Regulating ;  
 Binks, 541.  
 Porteous, 591.  
 Supplying ;  
 Boura, 350.

**Waterclosets :**

Bell, 181.  
 White, Henderson, and Cow  
 508.  
 Tylor and Frasi, 509.  
 Harlow, 605.  
 Devon, 658.

**Water-mark :**

On paper ;  
 Johnson, 298.

**Water-power :**

Obtaining ;  
 Lane, 555.

**Weaving :**

Siever, 30.  
 Desgrand, 31.  
 Sievier, 32, 35.  
 Nickels, C., 40.  
 Robertson, 48.  
 Poole, 49.  
 Sievier, 52.

Weaving—*cont.*

Hancock, J., 55.  
 Bedells, Nickels, C., and Turner, 60.  
 Hancock, W., junr., 60.  
 Nickels, C., 65.  
 Bedels, 73.  
 Nickels, C. and B., 73.  
 Cotter, 78.  
 Alsop and Foster, 78.  
 Nickels, C., 80.  
 Brooman, 81.  
 Clark, 84.  
 Taylor, 89.  
 Burke, 93.  
 Nalder, 104.  
 Newton, 105.  
 Bingley, 108.  
 Lutel (*Oudinot*), 109.  
 Nickels, C., 115.  
 Platt and Palmer, 116.  
 Tyrrell, 119.  
 Walker, 128.  
 Mackenzie, 130.  
 Sievier, 132.  
 Nickels, C., 138.  
 Kurtz, 138.  
 Westhead, 139.  
 Mason and Collier, 141.  
 Nickels, C., 146.  
 Haines, 147.  
 Richards, Taylor, and Wyld, 150.  
 Tayler and Hurst, 151.  
 Tatham and Cheetham, 155.  
 Newton, 157.  
 Longdon and Taberer, 161.  
 Sievier, 166.  
 Crossley, 167.  
 Newton, 170.  
 Nickels, C., Ball and Bagley, 177.  
 Tatham and Cheetham, 212.  
 Tayler and Slater, 225.  
 Crosby, 227.  
 Fontainemoreau, 240.  
 Watt, 240.  
 Rothwell, 247.  
 Nickels, 293.  
 Houston, 294.  
 Green, 321.  
 Bessemer, 327.  
 Vaughan and Scattergood, 359.  
 Crofts, 372.  
 Coates, 378, 400.  
 Radcliffe, 414.  
 Smith, 433.  
 Vaughan and Scattergood, 441.  
 Markland, 479.  
 Radcliffe, 483.  
 Benfrew, 510.  
 Fletcher, 557.  
 Johnson, 559.  
 Fawcett's, 561.  
 Johnson, 563.  
 Bonnet, 569.  
 Johnson (*Wacrenier*), 571.  
 Butcher and Newey, 579.

Weaving—*cont.*

Johnson (*Wacrenier*), 586, 588.  
 Yeadon and Chapman, 615.  
 Knowles and Clarke, 616.  
 Hardon and Henry, 620.  
 Heald, 638.  
 Newton, 648.  
 Pidding, 658.

Weights :

Indicating :  
 Shanks, 399.  
 Measuring :  
 Shanks, 399.

Whalebone :

Preparing :  
 Riant, 625.

Wheels :

Manufacturing, &c. :  
 Duncan, 174.  
 Lillie, 175.  
 Hodge, 181.  
 Coleman, 190.  
 Marcus, 204.  
 Dunlop, 205.  
 Daft, 217.  
 Scott, 550.  
 Goodyear, 573.  
 Fuller, 603.  
 Scott, 604.

Whips :

Holding :  
 Cockings and Potts, 583.

Wickets :

(Cricket) :  
 Yates, 477.

Wind :

Force of ;  
 Alliot, 141.

Windmills :

Zahn and Wells, 597.

Windows :

Soward, 122.  
 Milwain, 148.  
 Coleman, 190.  
 Russell, 317.  
 Greenwood, 405.

Window Blinds :

Perry, 101.  
 Soward, 122.  
 Kimberley, 359.  
 Livsey, 615.

Window-sashes :

Perry, 101.  
 Soward, 122.  
 Couchman, 254.

**Wire Gauze :**

## Covering :

Hancock, J., 53.

———, C., 99.

Bunn, 173.

Graham, 314.

Wilkinson, 375.

Goodyear, 574.

**Wires, Telegraph :**

## Covering :

Barlow and Forster, 127.

Ricardo, 131.

Siemens, 153.

Chatterton, 172.

Poole, 184.

——— (*Goodyear*), 198, 201.

Harrison, C. W. and J. J., 221.

Henley, 236.

Physick, 240.

Nickels, C., and Selby, 368.

Wilkinson, 375.

Breckmann, 424.

Gilpin, 456.

Johnson, 490.

Henson, 504.

Balestrini, 580.

Statham, 583, 595.

Macintosh, 635.

**Witney :**

## Finish :

Morphet, 623.

**Wood :**

## Preserving :

Benjamin, 13.

Bethell, 51.

Davies, 52.

**Wood—*cont.***

Parkes, 66.

Fife, 263.

Bethell, 283.

Assanti, 434.

**Wood :**

## Imitation of :

Ley, 233.

**Woodcuts :**

Hancock, C., 98.

**Wool :**

## Preparing, &amp;c. :

Harris, 25.

Lister, 330.

Bailey, 402.

Perry, 513.

**Wool :**

## Washing :

Lister, 285, 330, 348.

**Wringing :**

Thornton's, 586.

Underhill, 643.

**Writing :**

## Materials :

Goodyear, 342, 362.

Taylor, 414, 642.

## Cases :

Nickels, C. 84.

**LONDON :**

Printed by GEORGE E. FTEE and WILLIAM SPOTTISWOODS,  
 Printers to the Queen's most Excellent Majesty.

[Advertisement.]



## PATENT LAW AMENDMENT ACT, 1852.

WORKS printed by order of THE COMMISSIONERS OF  
PATENTS FOR INVENTIONS, and sold at the GREAT  
SEAL PATENT OFFICE, 25, Southampton Buildings,  
Chancery Lane, London.

**C**HRONOLOGICAL INDEX of PATENTS of INVEN-  
TION, from March 2, 1617 (14 James I.), to the 1st October,  
1852 (16 Vict.) 2 vols. (1554 pages). London, 1854...Price 30s.

**A**LPHABETICAL INDEX for the above period. 1 vol.  
(647 pages). London, 1854.....Price 20s.

**S**UBJECT-MATTER INDEX for the above period. 2 vols.  
(970 pages). Second edition. London, 1857 .....Price 2l. 16s.

**R**EFERENCE INDEX of PATENTS of INVENTION,  
pointing out the Office in which each Enrolled Specification  
of a Patent may be consulted; the Books in which Specifi-  
cations, Law Proceedings, and other subjects connected with In-  
ventions have been noticed; also such of the Specifications of  
Patents granted since the 14th James I. as have been published  
by the authority of the Commissioners. 1 vol. (681 pages).  
London, 1855.....Price 30s.

**A**PPENDIX to the REFERENCE INDEX of PATENTS of  
INVENTION, containing Abstracts from such of the early  
Patents and Signet Bills as describe the nature of the Invention,  
and which Patents have no enrolled Specifications. 1 vol. (91  
pages). London, 1855.....Price 4s.

**CHRONOLOGICAL INDEXES of APPLICATIONS for PATENTS and PATENTS GRANTED from the 1st October to the 31st December, 1852, and for the year 1853.** 1 vol. (258 pages). London, 1854 ..... Price 11s.

**ALPHABETICAL INDEXES for the above periods.** 1 vol. (181 pages). London, 1854..... Price 13s.

**SUBJECT-MATTER INDEX, for 1852.** 1 vol. (132 pages). London, 1855..... Price 9s.

**SUBJECT-MATTER INDEX, for 1853.** 1 vol. (291 pages). London, 1856 ..... Price 16s.

**CHRONOLOGICAL INDEX of APPLICATIONS for PATENTS and PATENTS GRANTED for 1854.** 1 vol. (167 pages). London, 1855 ..... Price 6s.

**ALPHABETICAL INDEX for the above period.** 1 vol. (119 pages). London, 1855 ..... Price 7s.

**SUBJECT-MATTER INDEX for the above period.** 1 vol. (311 pages). London, 1856..... Price 16s. 6d.

**CHRONOLOGICAL INDEX of APPLICATIONS for PATENTS and PATENTS GRANTED for 1855.** 1 vol. (188 pages). London, 1856 ..... Price 6s. 6d.

**ALPHABETICAL INDEX for the above period.** 1 vol. (129 pages). London, 1856 ..... Price 7s. 6d.

**SUBJECT-MATTER INDEX for the above period.** 1 vol. (311 pages). London, 1856 ..... Price 17s.

**CHRONOLOGICAL INDEX of APPLICATIONS for PATENTS and PATENTS GRANTED for 1856.** 1 vol. (189 pages). London, 1857..... Price 6s. 6d.

**ALPHABETICAL INDEX for the above period.** 1 vol. (143 pages). London, 1857..... Price 8s.

**SUBJECT-MATTER INDEX for the above period.** 1 vol. (355 pages). London, 1857..... Price 18s. 6d.

**CHRONOLOGICAL INDEX of APPLICATIONS for PATENTS and PATENTS GRANTED from the 1st January to the 31st December, 1857.** 1 vol. (196 pages) ..... Price 6s. 6d.

**THE ALPHABETICAL INDEX for the above Period.** 1 vol. (153 pages) ..... Price 8s.

**THE SUBJECT-MATTER INDEX for the above period.** 1 vol. (368 pages)..... Price 19s. 6d.



**THE CHRONOLOGICAL INDEX of APPLICATIONS for PATENTS and PATENTS GRANTED from the 1st January to the 31st December 1858.** 1 vol. (188 pages.).....Price 6s.

**THE ALPHABETICAL INDEX for the above period.** 1 vol. (148 pages.).....Price 8s.

**SPECIFICATIONS of PATENTS of INVENTION, DISCLAIMERS, &c.** deposited and filed under the Act commencing 1st October, 1852.

**SPECIFICATIONS of PATENTS of INVENTION, DISCLAIMERS, &c.,** enrolled under the old Law, numbering 12,977.

**SUPPLEMENT to the SERIES of LETTERS PATENT and SPECIFICATIONS of LETTERS PATENT for INVENTIONS** recorded in the Great Seal Patent Office, and granted between the 1st of March (14 Jac. 1.) A.D. 1617, and the 1st October (16 Vict.) A.D. 1852; consisting for the most part of Reprints of scarce Pamphlets, descriptive of the early patented Inventions comprised in that Series. Edited by BENNET WOODCROFT, Superintendent of Specifications, &c. In one vol., price 9s. 6d., or each Tract separately at the price affixed.

#### CONTENTS OF VOL. I.

1. Metallica; or the treatise of Metallica, briefly comprehending the doctrine of diverse new metallical inventions, &c. By SIMON STURTEVANT. (*Letters Patent, dated 29th February 1611.*) Price 1s. 4d.
2. A Treatise of Metallica, but not that which was published by Mr. Simon Sturtevant, upon his Patent, &c. By JOHN ROBINSON. (*Letters Patent, granted A.D. 1612.*) Price 4d.
3. A Commission directed to Sir Richard Wynne and others to inquire upon oath whether NICHOLAS PAGE or Sir NICHOLAS HALSE was the first inventor of certain kilnes for the drying of malt, &c. &c. (*Letters Patent, Nos. 33 and 85, respectively dated 8th April 1626, and 23rd July 1636.*) Price 2d.
4. DUD DUDLEY's Metallum Martis; or iron made with pit-coale, sea-coale, &c. (*Letters Patent, Nos. 18 and 117, respectively dated 22nd February 1620, and 2nd May 1638.*) Price 8d.
5. Description of the nature and working of the Patent Waterscoop Wheels invented by WILLIAM WHEELER, as compared with the raising wheels now in common use. By J. W. B. Translated from the Dutch by Dr. Tolhausen. (*Letters Patent, No. 127, dated 24th June 1642.*) Price 2s.
6. An exact and true definition of the stupendous Water-commanding Engine, invented by the Right Honourable (and deservedly to be praised and admired) EDWARD SOMERSET, Lord Marquis of WORCESTER, &c. &c. (*Stat. 15 Car. II. c. 12. A.D. 1663.*) Price 4d.
7. Navigation improved; or the art of rowing ships of all rates in calms with a more easy, swift, and steady motion than oars can. By THOMAS SAVERY. (*Letters Patent, No. 347, dated 10th January 1696.*) Price 1s.
8. The Miner's Friend; or an engine to raise water by fire, described, &c. By THOMAS SAVERY. (*Letters Patent, No. 356, dated 25th July 1698, and Stat. 10 & 11 Will. III. c. 31, A.D. 1699.*) Price 1s.
9. Specimina Ichnographica; or a brief narrative of several new inventions and experiments, particularly the navigating a ship in a calm, &c. By JOHN ALLEN, M.D. (*Letters Patent, No. 613, dated 7th August 1729.*) Price 8d.
10. A description and draught of a new-invented Machine for carrying vessels or ships out of or into any harbour, port, or river against wind and tide, or in a calm, &c. By JONATHAN HULLS. (*Letters Patent, No. 356, dated 21st December 1736.*) Price 8d.
11. An historical account of a new method for extracting the foul air out of ships, &c., with the description and draught of the machines by which it is performed, &c. By SAMUEL SUTTON, the Inventor. To which are annexed two relations given thereof to the Royal Society by Dr. Mead and Mr. Watson. (*Letters Patent, No. 602, dated 16th March 1744.*) Price 1s.

**A**N INDEX to ALL INVENTIONS PATENTED in ENGLAND from 1617 to 1854 inclusive, arranged under the greatest number of heads, with parallel references to INVENTIONS and DISCOVERIES described in the scientific works of VARIOUS NATIONS, as classified by Professor Schubarth. By B. WOODCROFT.

The foreign works thus indexed form a portion of the Library of the Commissioners of Patents, where they may be consulted, or manuscript translations be had.

---

SOMMAIRE de toutes les INVENTIONS BREVETÉES en ANGLETERRE depuis 1617 jusqu'en 1854 inclusivement, arrangées d'après le plus grand nombre de rubriques, avec renvois aux INVENTIONS et DÉCOUVERTES décrites dans les ouvrages scientifiques de DIFFÉRENTES NATIONS, classés par le Professeur Schubarth. Par B. Woodcroft.

Les ouvrages étrangers ci-dessus font partie de la Bibliothèque de la Commission des Patentes, où l'on peut les consulter, et obtenir des traductions à manuscrit.

---

VERZEICHNISS aller in ENGLAND von 1617—1854 incl. PATESTIERTEN ERFINDUNGEN, unter vielfältige Titel gebracht mit Hinweisungen auf ERFINDUNGEN und ENTDECKUNGEN die nach Prof. Schubarth's Klassificirung in den wissenschaftlichen Werken VERSCHIEDENER NATIONEN beschrieben sind. Von B. Woodcroft.

Die hier aufgeführten fremden Werke machen einen Theil der Bibliothek der Patent Commission aus, allwo sie nachgeschlagen oder schriftliche Uebersetzungen besorgt werden können.

---

REPERTORIO di tutte le INVENZIONI munite di LETTERE PATENTI in INGHILTERRA dal 1617—1854 inclusivo, poste in ordine sotto il più gran numero di capi, con riferenze alle INVENZIONI e SCOPERTI descritti nelle opere scientifiche di DIVERSE NAZIONI, classate dal Professore Schubarth. Dal Sig. B. Woodcroft.

Le opere straniere qui indicate possono esser consultate nella Biblioteca dei Commissari delle Patenti, e traduzioni in manuscritto vi possono ottenersi.

B. WOODCROFT,  
Superintendent of Specifications, &c.

---

**C**ATALOGUE of the LIBRARY of the GREAT SEAL PATENT OFFICE. Two vols. imp. 8vo. (Vol. I. Titles; Vol. II. Index.) Price 21s.

---

#### PATENT MUSEUM AND LIBRARY AT SOUTH KENSINGTON.

**T**HIS Museum is open to the public daily, free of charge. The hours of admission are from 10 A.M. to 6 P.M., and in the evenings of Monday, Tuesday, and Wednesday from 7 to 10 P.M.

All communications on the subject of the Museum to be addressed to the Superintendent,

Great Seal Patent Office,  
Southampton Buildings.

B. WOODCROFT.

---

**In course of Publication, by Order of the Commissioners.**

**A**BRIDGMENTS (in Classes and Chronologically arranged) of all SPECIFICATIONS of PATENTED INVENTIONS, from the earliest enrolled to those published under the Act of 1852.

These books are of 12mo. size, and as each is limited to inventions of one class only, they can be sold at prices sufficiently moderate to enable the humblest inventor to examine for himself whether his discovery has been previously patented or not.

At the foot of each abstract is given references to notices of the inventions in scientific and other works, and to the reports of law proceedings for infringements, &c. &c. &c.

The classes already published are,—

1. DRAIN TILES AND PIPES, price 6*d*.
2. SEWING AND EMBROIDERING, price 6*d*.
3. MANURE, price 6*d*.
4. PRESERVATION OF FOOD, price 6*d*.
5. MARINE PROPULSION, price 4*s*.
6. MANUFACTURE OF IRON AND STEEL, price 5*s*.
7. AIDS TO LOCOMOTION, price 1*s*.
8. STEAM CULTURE, price 2*s*.
9. WATCHES, CLOCKS, & OTHER TIMEKEEPERS, price 1*s*. 6*d*.
10. FIRE-ARMS AND OTHER WEAPONS, AMMUNITION, AND ACCOUTREMENTS, price 6*s*. 6*d*.
11. PAPER:—Part I. MANUFACTURE OF PAPER, PASTEBOARD, AND PAPIER MÂCHÉ, price 3*s*.
12. PAPER:—Part II. CUTTING, FOLDING, AND ORNAMMENTING; INCLUDING ENVELOPES, CARDS, PAPER-HANGINGS, &c., price 2*s*.
13. TYPOGRAPHIC, LITHOGRAPHIC, AND PLATE PRINTING, price 7*s*.
14. BLEACHING, DYEING, AND PRINTING YARNS AND FABRICS, price 9*s*. 6*d*.
15. ELECTRICITY AND MAGNETISM; THEIR GENERATION AND APPLICATIONS, price 8*s*. 6*d*.
16. MANUFACTURE AND APPLICATION OF INDIA-RUBBER, GUTTA PERCHA, &c.; INCLUDING AIR, FIRE, AND WATER PROOFING, price 10*s*.

The following are in the press:—

PREPARATION OF FUEL, AND APPARATUS FOR ITS COMBUSTION.

PRODUCTION AND APPLICATION OF GAS.

STEAM ENGINES.

METALS AND ALLOYS.

**A FREE LIBRARY and READING ROOMS** are open to the Public daily, from 10 till 4 o'clock, in the Office of the Commissioners of Patents, 25, Southampton Buildings, Chancery Lane.

In addition to the printed Specifications, Indexes, and other publications of the Commissioners, the Library includes a Collection of the leading British and Foreign Scientific Journals, and text-books in the various departments of science and art. A catalogue is on sale.

**NOTE.**—The Commissioners' publications may be consulted daily in the Library of the British Museum, in the Library of the Society of Arts, and in the Free Libraries of the following Towns and Cities:—

- |   |   |
|---|---|
| <p>Aberdeen (<i>Public Library, Town House</i>).<br/>         Accrington (<i>Mechanics' Institute, Bank Street</i>).<br/>         Belfast (<i>Harbour Office, Corporation Square</i>).<br/>         Beverley (<i>Guildhall</i>).<br/>         Birmingham (<i>Birmingham and Midland Institute, Cannon Street</i>).<br/>         Bolton-le-Moors (<i>Public Library, Exchange Buildings</i>).<br/>         Bradford, Yorkshire (<i>Borough Accountant's Office, Corporation Buildings, Swain Street</i>).<br/>         Brighton (<i>Town Hall</i>).<br/>         Bristol (<i>City Library, King Street</i>).<br/>         Burnley (<i>Office of the Burnley Improvement Commissioners</i>).<br/>         Cambridge (<i>Free Library, Jesus Lane</i>).<br/>         Canterbury (<i>Municipal Museum, Guildhall Street</i>).<br/>         Carlisle (<i>Free Library, Police Office</i>).<br/>         Chester (<i>Town Hall, Northgate St.</i>)<br/>         Cork (<i>Royal Cork Institution, Nelson Place</i>).<br/>         Crewe (<i>Railway Station</i>).<br/>         Darlington (<i>Mechanics' Institute, Skinnergate</i>).<br/>         Dorchester.<br/>         Drogheda.<br/>         Dublin (<i>Royal Dublin Society, Kildare Street</i>).<br/>         Dundalk.<br/>         Falmouth (<i>Public Library, Church Street</i>).<br/>         Gateshead (<i>Mechanics' Institute</i>).<br/>         Gorton (<i>Railway Station</i>).<br/>         Glasgow (<i>Stirling's Library, Miller Street</i>).<br/>         Grimshy, Great (<i>Mechanics' Institution, Victoria Street</i>).<br/>         Hanley, Staffordshire Potteries (<i>Town Hall</i>).<br/>         Hartlepool, West (<i>Literary and Mechanics' Institute, Church Street</i>).<br/>         Hertford (<i>Public Library, Town Hall</i>).<br/>         Huddersfield (<i>Commissioners' Offices, No. 1, South Parade</i>).<br/>         Hull (<i>Mechanics' Institute, George St.</i>)<br/>         Ipswich (<i>Museum Library, Museum Street</i>).<br/>         Keighley (<i>Mechanics' Institute, North Street</i>).<br/>         Kidderminster (<i>Public Free Library, Public Buildings, Vicar Street</i>).</p> | <p>Kings' Lynn, Norfolk (<i>Stanley Library, Athenæum</i>).<br/>         Lancaster (<i>Mechanics' Institute, Market Street</i>).<br/>         Leamington Priors (<i>Public Library, Town Hall</i>).<br/>         Leeds (<i>Town Clerk's Office, Town Hall</i>).<br/>         Leicester (<i>Corporation Library, Town Hall</i>).<br/>         Limerick.<br/>         Liverpool (<i>Free Public Library, Duke Street</i>).<br/>         — (<i>Royal Institution</i>).<br/>         London (<i>British Museum</i>).<br/>         — (<i>Society of Arts (John Street, Adelphi)</i>).<br/>         Macclesfield (<i>Useful Knowledge Society</i>).<br/>         Maidstone.<br/>         Manchester (<i>Chetham Hospital</i>).<br/>         — (<i>Free Library, Camp Field</i>).<br/>         Montrose.<br/>         Newark, Nottingham (<i>Mechanics' Institute, Middle Gate</i>).<br/>         Newcastle-upon-Tyne (<i>Literary and Philosophical Society</i>).<br/>         Newport, Monmouth (<i>Commercial Room, Town Hall</i>).<br/>         Northampton.<br/>         Norwich (<i>Free Library, St. John's, Maddermarket</i>).<br/>         Nottingham (<i>Corporation Rooms, St. Peter's Churchside</i>).<br/>         Oxford (<i>Public Free Library, Town Hall</i>).<br/>         Paisley (<i>Government School of Designs, Gilmour Street</i>).<br/>         Plymouth (<i>Mechanics' Institute, Princess Square</i>).<br/>         Preston (<i>Mr. Shepherd's Library, the Institution, Avenham</i>).<br/>         Reading (<i>Literary, Scientific and Mechanics' Institution, London St.</i>)<br/>         Rochdale (<i>Commissioners' Room, Smith Street</i>).<br/>         Rotherham (<i>Board of Health Offices, Howard Street</i>).<br/>         Salford (<i>Peel Park</i>).<br/>         Sheffield (<i>Free Library, Surrey St.</i>)<br/>         Shrewsbury (<i>The Public Museum, College Street</i>).<br/>         Southampton (<i>Corporation Library Audit House</i>).</p> |
|---|---|

Stirling (*Burgh Library, Town House, Broad Street*).  
 Stockport (*Court House, Vernon Street, Warren Street*).  
 Sunderland (*Corporation Museum, Athenæum, Fawcett Street*).  
 Tiverton.  
 Wakefield (*Mechanics' Institution, Barston Square*).  
 Warrington (*The Museum and Library*).  
 Waterford (*Town Hall, The Mall*).

Wednesbury (*Board of Health Offices*).  
 Wexford (*Mechanics' Institute, Crescent Quay*).  
 Wigan.  
 Wolverhampton (*School of Practical Art, Darlington Street*).  
 Wolverton (*Railway Station*).  
 Yarmouth, Norfolk (*Public Library, South Quay*).  
 York (*Lower Council Chamber, Guildhall*).

The Commissioners' publications have also been presented to the following Public Offices, Institutions, Seats of Learning, British Colonies, and Foreign States :—

*Public Offices, Institutions, &c.*

Admiralty, Department of the Surveyor  
 of the Navy.  
 ——— Steam Branch.  
 ——— Deptford Dockyard.  
 ——— Woolwich ditto.  
 ——— Chatham ditto.  
 ——— Sheerness ditto.  
 ——— Portsmouth ditto.  
 ——— Devonport ditto.  
 ——— Pembroke ditto.  
 Artillery Institute, Woolwich.  
 Board of Trade, Whitehall.  
 Ordnance Office, Pall Mall.

Ordnance Office, Small Arms Factory, Enfield.  
 War Office, Pall Mall.  
 Government School of Mines, &c., Jermyn Street, Piccadilly.  
 Dublin Castle, Dublin.  
 Rolls Office, Chancery (Four Courts), Dublin.  
 Office of Chancery, Edinburgh.  
 East India House, Military Stores, Leadenhall Street.  
 Incorporated Law Society, Chancery Lane, London.

*Seats of Learning.*

Cambridge University.  
 Trinity College, Dublin.

Queen's College, Galway.  
 University College, London.

*British Colonies.*

Malta.  
 Cape of Good Hope.  
 Mauritius.  
 India—Bengal  
 North-West Provinces.  
 Madras.  
 Bombay.  
 Ceylon.  
 Victoria—Patent Office, Melbourne.  
 Parliamentary Library, Melbourne.  
 New South Wales.  
 South Australia.

Tasmania.  
 New Zealand.  
 Newfoundland.  
 Canada—Quebec.  
 Toronto.  
 New Brunswick.  
 Prince Edward Island.  
 Antigua.  
 Barbados.  
 Jamaica.  
 Trinidad.  
 British Guiana.

*Foreign States.*

Austria—Handels Ministerium, Vienna.  
 Bavaria—Königliche Bibliothek, Munich.  
 Belgium—Ministère de l'Intérieur, Brussels.  
 France—Bibliothèque Impériale,  
 Conservatoire des Arts et Métiers, } Paris.  
 Hôtel de Ville,  
 Gotha—Ducal Friedenstein Collection.  
 Hanover—Ministerium des Innern, Hanover.  
 Netherlands—Ministère de l'Intérieur, The Hague.  
 Prussia—Handels Ministerium, Berlin.  
 Russia—Bibliothèque Impériale, St. Petersburg.  
 Sardinia—Ufficio delle Privative, Turin.  
 Saxony—Polytechnische Schule, Dresden.  
 Sweden—Stockholm.  
 United States—The Patent Office, Washington.  
 The Astor Library, New York.  
 The State Library, Albany.  
 The Franklin Institute, Philadelphia.  
 The Free Library, Boston.  
 The Philadelphia Library.  
 Wurtemberg—Bibliothek des Musterlagers, Stuttgart.

**PATENT RIGHTS in the COLONIES.**—Abstract of Replies to the Secretary of State's Circular Despatch of July 11, 1856, calling for Information as to the form of the application to be made by persons desirous of obtaining Patent Rights in the Colonies, and the expenses attendant on the Grant of such Patent Rights. Price 2s. 6d.

**COLONIAL PATENTS.**—Information as to the Mode of Obtaining Protection for Inventions in the Colonies; contained in Communications from the Governors, &c. of the different British Colonies in answer to the Application of Mr. W. J. CURTIS for a Patent. Price 1s.

**FIRE-ARMS, PROJECTILES, &c.**—The series of Specifications and Drawings on this subject, from 15th May, 1718, to 31st December, 1853 ..... Price 9l. 18s. 6½d.

**REAPING MACHINES.**—The series of Specifications and Drawings on this subject to the end of 1853, together with an Appendix prepared by B. Woodcroft, of the Great Seal Patent Office, and published under the sanction of the Commissioners.....Price 2l. 3s. 11½d.

**COMMISSIONERS OF PATENTS' JOURNAL,** published on the evenings of Tuesday and Friday in each week. Price 2d. Annual subscription, including postage, 30s.

Volume for the year 1854,	cloth.	Price 21s.
Ditto -	1855,	„ Price 21s.
Ditto -	1856,	„ Price 21s.
Ditto -	1857,	„ Price 21s.
Ditto -	1858,	„ Price 21s.

#### CONTENTS.

- |  |  |
|--|--|
| 1. Grants of Provisional Protection for six months.                                | 8. Patents which have become void by nonpayment of the stamp duty of 50l. before the expiration of the third year. |
| 2. Inventions protected for six months by the deposit of a complete Specification. | 9. Patents on which the seventh year's stamp duty has been paid.   |
| 3. Notices to proceed.   | 10. Colonial Patents and Patent Law.   |
| 4. Patents sealed.   | 11. Foreign Patents and Patent Law.  |
| 5. Patents extended.   | 12. Official advertisements and notices of interest to patentees and inventors generally.                          |
| 6. Patents cancelled.  |  |
| 7. Patents on which the third year's stamp duty has been paid.                     |  |

#### INFORMATION FOR APPLICANTS FOR PATENTS.

**THE PATENT LAW AMENDMENT ACTS** (15 & 16 Vict., cap. 83; 16 Vict., cap. 5; and 16 & 17 Vict., cap. 115); together with the Rules and Regulations issued by the Commissioners of Patents for Inventions, and by the Lord Chancellor and the Master of the Rolls, under the Acts 15 & 16 Vict., c. 83, and 16 & 17 Vict., c. 115, accompanied by Specimen Forms of the Provisional Documents printed on sheets of the prescribed size... Price 6d.







